CANADA

NATIONAL ENERGY BOARD
REASONS FOR DECISION

In the Matter of a Public Hearing Respecting the Tolls to be Charged in the Operation of the Prebuilt Facilities

by

Foothills Pipe Lines (Yukon) Ltd.

August 1981

NATIONAL ENERGY BOARD

REASONS FOR DECISION

IN THE MATTER OF A PUBLIC HEARING

RESPECTING THE TOLLS TO BE CHARGED

IN THE OPERATION OF THE PREBUILT FACILITIES

BY

FOOTHILLS PIPE LINES (YUKON) LTD.

AUGUST 1981

Ce rapport est publié
séparément dans les deux
langues officielles.

NATIONAL ENERGY BOARD

IN THE MATTER OF the National Energy Board Act and the Regulations made thereunder, and the Northern Pipeline Act; and

IN THE MATTER OF a public hearing respecting the tolls to be charged by Foothills Pipe Lines (Yukon) Ltd. in the operation of its prebuilt facilities, and other related matters.

(File: 1562-F6-2)

HEARD AT Ottawa, Ontario on:

31	March 1981
1, 2, 3, 6, 7, 22, and 23	April 1981

B E F O R E:

R.F. Brooks	Presiding Member
J.R. Jenkins	Member
R.B. Horner	Member

APPEARANCES:

Mr. J. Lutes	Foothills Pipe Lines (Yukon) Ltd.
Mr. L. Sali	Atlantic Richfield Company
Mr. P.L. Fournier	Canadian Petroleum Association
Mr. G.D. Nichols	Consolidated Natural Gas Limited
Mr. J.H. Smellie	Dome Petroleum Limited
Mr. A.R. O'Brien) Mr. E.A. Abssy)	Imperial Oil Limited
Mr. G.D. Nichols	Northern Border Pipeline Company
Mr. G.D. Nichols	Northern Natural Gas Company
Mr. E.B. McDougall	Northwest Alaskan Pipeline Company
Mr. L.H. Pilon	TransCanada PipeLines Limited
Mr. A. Mudryj	Union Gas Limited
Mr. H. Wetston	National Energy Board

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ABBREVIATIONS AND DEFINITIONS

"Act" - Northern Pipeline Act.

"AFUDC" - Allowance for Funds Used During Construction

"ANG" - Alberta Natural Gas Company Ltd

"CCA" - Capital Cost Allowance

"FDCE" - Final Design Cost Estimates

"Foothills (Yukon)" or "the Company" - Foothills Pipe Lines (Yukon) Ltd. is the parent company responsible for the Canadian portion of the Alaska Highway Gas Pipeline Project. Foothills (Yukon) is currently sponsored 50 per cent each by NOVA and Westcoast. The ownership of the pipeline is segmented into six federally-incorporated subsidiaries.

"Foothills (South Yukon)" - Foothills Pipe Lines (South Yukon) Ltd., owned 100 per cent by Foothills (Yukon), will own, operate and manage the approximately 830 kilometres of pipeline through the southern Yukon.

"Foothills (North B.C.)" - Foothills Pipe Lines (North B.C.) Ltd. owned 51 per cent by Foothills (Yukon) and 49 per cent by Westcoast, will own, operate and manage the approximately 710 kilometres of pipeline through northern British Columbia.

"Foothills (Alta.)" - Foothills Pipe Lines (Alta.) Ltd. owned 51 per cent by Foothills (Yukon) and 49 per cent by NOVA, will own, operate and manage the approximately 1,300 kilometres of pipeline through Alberta.

"Foothills (Sask.)" - Foothills Pipe Lines (Sask.) Ltd., owned 100 per cent by Foothills (Yukon), will own, operate and manage the approximately 260 kilometres of pipeline in Saskatchewan.

"Foothills (South B.C.)"	-	Foothills Pipe Lines (South B.C.) Ltd., owned 51 per cent by Foothills (Yukon) and 49 per cent by ANG, will own, operate and manage the approximately 170 kilometres of pipeline through southern British Columbia.
"Foothills (North Yukon)"	-	Foothills Pipe Lines (North Yukon) Ltd., owned 100 per cent by Foothills (Yukon), will own, operate and manage the approximately 1,180 kilometres of pipeline through the Yukon and Northwest Territories to connect Delta gas to Whitehorse along the Dempster Highway.
"IROR"	-	Incentive Rate of Return
"NEB" or "the Board"	-	National Energy Board
"NOVA"	-	NOVA, AN ALBERTA CORPORATION, formerly The Alberta Gas Trunk Line Company Limited
"NPA"	-	Northern Pipeline Agency
"PFUDC"	-	Provision for Funds Used During Construction
"Westcoast"	-	Westcoast Transmission Company Limited
1979-1980 Tariff Hearing	-	Public Hearing held in four phases during 1979 and 1980 respecting the tariffs and tolls to be charged, the financing of the pipeline and other related matters. Each phase resulted in a decision, as follows:
Phase I Decision	-	"National Energy Board Reasons for Decision in the Matter of Phase I of a Public Hearing Respecting the Tariffs and Tolls to be Charged, the Financing of the Pipeline and Other Related Matters of Foothills Pipe Lines (Yukon) Ltd., July 1979."

Phase II Decision	-	"National Energy Board Reasons for Decision in the Matter of Phase II of a Public Hearing Respecting the Tariffs and Tolls to be Charged, the Financing of the Pipeline and Other Related Matters of Foothills Pipe Lines (Yukon) Ltd., October 1979."
Phase III Decision	-	"National Energy Board Reasons for Decision in the Matter of Phase III of a Public Hearing Respecting the Tariffs and Tolls to be Charged, the Financing of the Pipeline and Other Related Matters of Foothills Pipe Lines (Yukon) Ltd., November 1979."
Phase IV(a) Decision	-	"National Energy Board Reasons for Decision in the Matter of Phase IV(a) of a Public Hearing Respecting the Tariffs and Tolls to be Charged, the Financing of the Pipeline and Other Related Matters of Foothills Pipe Lines (Yukon) Ltd., March 1980."
Phase IV(b) Decision	-	"National Energy Board Reasons for Decision in the Matter of Phase IV(b) of a Public Hearing Respecting the Tariffs and Tolls to be Charged, the Financing of the Pipeline and Other Related Matters of Foothills Pipe Lines (Yukon) Ltd., May 1980."
Phase IV(b) Re-Opened	-	"National Energy Board Reasons for Decision in the Matter of a Public Hearing Respecting Tariffs and Tolls to be Charged, the Financing of the Pipeline, and Other Related Matters of Foothills Pipe Lines (Yukon) Ltd., June 1980."

INTRODUCTION AND BACKGROUND

During 1979 and 1980, Foothills (Yukon) appeared before the Board at a hearing conducted in four phases concerning the tolls and tariffs to be charged on Canadian sections of the Alaska Highway Natural Gas Pipeline, and other related matters which included the Incentive Rate of Return Scheme and the financing of the Canadian sections.

Concurrent with the last part of the tariff hearing, Phase IV(b), the Board convened a hearing commencing on 29 April 1980 to provide Foothills (Yukon) with an opportunity to comply with the requirements of the amended Condition 12(1) of Schedule III to the Northern Pipeline Act, that is to establish to the satisfaction of the Board and of the Minister responsible for the Northern Pipeline Agency that financing had been obtained for the "prebuild" facilities and could be obtained for the rest of the mainline in Canada. In July 1980, as a result of these two hearings, the Federal Government approved construction of the southern, or prebuild portions, of the system.

Construction of the western leg facilities to be prebuilt in Zone 7 in south western Alberta and Zone 8 in south eastern British Columbia commenced in August 1980, and was scheduled for completion early in 1981. These facilities were tentatively scheduled to go into operation in May 1981. However, there were a number of matters arising from the 1979-1980 tariff hearing which needed to be resolved before operation of the prebuilt facilities in Zones 7 and 8 could commence. Accordingly, on 4 February 1981, the Board issued Order No. RH-3-81 directing a public hearing to be held on these and other matters to commence 31 March 1981. A number of additional matters were raised by Foothills (Yukon) during the hearing, and the following are the issues on which evidence and submissions were heard.

1. FINAL DESIGN COST ESTIMATES FOR PREBUILD FACILITIES IN ZONES 7 AND 8 (WESTERN LEG)

During Phase III of the tariff hearing, the Board approved details of the IROR Scheme to be applied to the equity investment in the Canadian sections of the Alaska Highway Natural Gas Pipeline.

During Phase IV(a), the Scheme was amended with respect to its application to prebuild facilities, and the amendment was extended, in Phase IV(b), to include the mainline facilities.

This amendment of the Scheme included changing the basis of cost performance measurement from the Filed Capital Costs, detailed in the Canada-U.S. Agreement contained in Schedule I to the Act, to the detailed cost estimates based on final design, known as the Final Design Cost Estimates (FDCE), described in Condition 16(a), Schedule III to the Act.

The final design is subject to approval by the NPA before construction commences, and the FDCE are subject to review by the Board prior to their acceptance for IROR scheme purposes. The design having been approved and construction being almost complete for prebuild facilities in Zones 7 and 8, review by the Board of the FDCE for those facilities for IROR Scheme purposes is necessary at this time in order to facilitate implementation of the Scheme.

2. FINAL DESIGN COST ESTIMATES FOR PREBUILD FACILITIES IN ZONES 6 AND 9 (EASTERN LEG)

Construction of the prebuild facilities in Zones 6 and 9 is planned to commence in 1981 with completion scheduled for the fall of 1982. Foothills (Yukon), cognizant of the problems encountered in reviewing estimates at a time when construction has commenced and actual costs are being incurred, requested that the Board review the Zone 6 and 9 FDCE before construction commenced.

3. SCOPE CHANGE

The IROR Scheme does not contain a definition of Scope Changes though the Act does state in paragraph 34:

> "34. The Board shall, in determining an appropriate rate of return on equity investment in a company,
> (a) take into account:
> (i) the capital cost estimates set out in the Agreement, and
> (ii) the extent to which variations in actual costs from the estimates referred to in subparagraph (i) were within or outside the control of the company;"

The Company applied for consideration of this matter during the hearing.

4. ALLOCATION AMONG SUBSIDIARY COMPANIES OF ADMINISTRATIVE AND OTHER EXPENSES INCURRED BY FOOTHILLS (YUKON)

During the 1979-1980 tariff hearing, the Board sought to establish a clear understanding of what the functional responsibilities of Foothills (Yukon) would be and how related costs, including the methods of allocation, would be treated during the following time periods:

i) January 1, 1979 to commencement of construction of the "prebuild" facilities,

ii) the period of construction of prebuild facilities, and planning for construction of the mainline, and

iii) the period of operation of prebuild facilities and construction of the mainline.

This subject was reviewed in detail in Phases III and IV(b) of the tariff hearing, but the Board was not fully satisfied as to the reasonableness of the method of allocation proposed by the Company. Therefore, the Board approved the method of allocating the administrative expenses of Foothills (Yukon) on an interim basis only, subject to review at a later date.

5. APPROVAL OF COSTS FOR RATE BASE PURPOSES

The NEB's Method for Regulating the Tolls and Tariffs of the Foothills (Yukon) Pipeline, pages 6 to 11, Appendix C, of the Phase I Decision provides:

> "4. Public hearings to deal expeditiously with applications for inclusion of construction costs in rate base will be held at least once a year."

The following costs are being considered for inclusion in rate base:

(1) Actual costs incurred in 1980 by Foothills (Yukon), its subsidiaries and sponsor companies, including allowance for funds used during construction,

(2) Reduction of Prior Years' Expenditures, and

(3) The cost of Northern Alberta Burst Test Facilities, approved on a provisional basis only in the Phase IV(b) Decision.

6. APPROVAL OF ESTIMATED COSTS FOR RATE BASE PURPOSES

The Method of Regulation mentioned in paragraph 5 above contains the following additional provision:

> "8. If, at the time the pipeline is due to commence operations, all actual costs have not been determined, the Board will permit estimates to be used provided the Board has approved the estimates in advance."

At the Board's request, the Company prepared an estimate of costs to be incurred after 1 January 1981 to complete construction of the prebuild facilities in Zones 7 and 8, which costs are being reviewed for provisional rate base purposes.

7. "ROLL DOWN" OF SPONSOR COMPANIES PRELIMINARY EXPENDITURES

Included in the estimate of costs to be incurred after 1 January 1981, as submitted by the Company in paragraph 6 above, are actual preliminary expenditures incurred by the sponsor companies prior to 1 August 1980. Foothills (Yukon) is applying for approval of these "roll down" costs for inclusion in rate base for prebuild facilities.

8. ESTIMATE OF THE ONE-TIME ADJUSTMENT TO RATE BASE UNDER THE IROR SCHEME

The Company applied for approval of its method of calculating the one-time adjustment to rate base for prebuild facilities under the IROR Scheme, and provided an estimate of this adjustment for inclusion in the rate base for prebuilt facilities in Zones 7 and 8.

9. GAS TRANSPORTATION AGREEMENT BETWEEN FOOTHILLS PIPE LINES (SOUTH B.C.) LTD. AND ALBERTA NATURAL GAS COMPANY LTD

This agreement, which is a component of the Gas Transportation Tariff - Phase I, the prebuild tariff, is subject to review for matters arising out of the public hearing into the tolls and tariffs of ANG and the Board's Decision thereon of May 1980 which was issued subsequent to the close of the Foothills (Yukon) 1979-1980 tariff hearing.

10. PROCEDURES RE OPERATING AND MAINTENANCE COSTS FOR THE FIRST YEAR OF OPERATION

The Method of Regulation mentioned in paragraph 5 above provides in Section 11 for the automatic flow-through into the cost of service of operating and maintenance costs up to the annual budget previously approved by the Board. Any overruns in excess of the budgeted amounts could not be included until reviewed by the Board.

The Method of Regulation also states that a special procedure for inclusion of overruns would apply during the first year of operation. However, on 4 February 1981, the Board indicated in a letter to the Company that, though the Board had considered various schemes, it had not found one which it believed would be more appropriate than that which would apply after the first year. Nevertheless, the Board invited the Company, or any intervenor, to submit any alternative proposal which it might wish to be considered during the hearing.

11. TARIFF AMENDMENTS

Foothills (Yukon) applied for Board approval of a number of amendments to its tariff and those of its subsidiaries.

12. COST OF SERVICE TOLL APPLICABLE TO THE PREBUILD FACILITIES IN ZONES 7 AND 8

To facilitate the Board's assessment of the justness and reasonableness of the toll arising from the Gas Transportation Tariff - Phase I, the prebuild tariff, as approved in the Phase IV(b) Decision, the Company was requested to file a copy of its estimate of the cost of service toll applicable to prebuild facilities in Zones 7 and 8 covering the period from the first flow of Alberta gas up to and including 31 December 1981.

PART I

INCENTIVE RATE OF RETURN ISSUES

1. FINAL DESIGN COST ESTIMATES FOR PREBUILD FACILITIES IN ZONES 7 AND 8 FOR INCENTIVE RATE OF RETURN PURPOSES

Zones 7 and 8 of the Alaska Highway Gas Pipeline Project form that portion of the project known as the Western Leg, which will run from Caroline, Alberta, to Kingsgate, B.C., paralleling the existing systems of NOVA and ANG. The prebuild facilities within those zones are the portions of the pipeline project which are being built to transmit for export natural gas of Canadian origin before the rest of the pipeline is placed in service for the transmission of Alaska gas. On the Western Leg, the prebuild facilities are to provide for an export capacity of 6.8 x $10^6 m^3/d$ at Kingsgate, B.C. In Zone 7, the prebuild facilities consist of a partial looping of 914 mm diameter pipe paralleling the existing system of NOVA in Alberta for a total distance of 124 km, and similarily in Zone 8, loops are being installed paralleling the ANG system in south eastern B.C. for a total distance of 89 km, scheduled to be completed in early 1981. In addition, the plans for the Zone 8 prebuild call for a meter station to be constructed at Kingsgate to measure the gas transported by Foothills.

The IROR Scheme to be applied to the equity investment in the Canadian sections of the Alaska Highway Natural Gas Pipeline will be established by zone on the basis of the cost performance for each zone. The cost performance will be measured by comparing the actual cost of construction of facilities in a zone with the detailed cost estimates for the same facilities associated with the final design approved by the NPA. The estimates, known as the Final Design Cost Estimates (FDCE), are subject to review by the Board prior to their acceptance for IROR Scheme purposes.

The FDCE for prebuild facilities in Zones 7 and 8 were first submitted to the Board by Foothills (Yukon) in March 1980, but a modified version was filed with the Board in September 1980. The amended estimates were the subject of examination during the current hearing.

The total estimated cost under examination for the Western and Eastern legs amounts to $821,321,000 for 866.4 km of pipeline, 3 compressor stations and 2 meter stations.

Construction details and submitted cost estimates for the Western leg are as follows:

TABLE 1

Zone	Pipeline Length km	Pipeline Diameter mm	Total Cost ($000)
7 Alberta	124	914	$89,454
8 B.C.	89	914	77,925*
TOTAL	213		$167,379

* Includes meter station at Kingsgate B.C.

The following is a summary of the cost components:

TABLE 2

($000)

	Zone 7	Zone 8	Total
Direct Costs	$50,881	$55,677	$106,558
Project Management	9,435	2,022	11,457
Contingency	6,066	5,850	11,916
Foothills (Yukon)	15,168	9,884	25,052
Sub-Total before PFUDC	81,550	73,433	154,983
PFUDC	7,904	4,492	12,396
Total	$89,454	$77,925	$167,379

For purposes of the IROR Scheme, though the estimates provide details of expenditures by quarter covering the period from early 1980 to expected completion in the 2nd quarter of 1981, all costs are described in constant dollars of a base period. For purposes of prebuilding in Zones 7 and 8 the Company has selected the base period

of 1 June 1980. Provision for Funds Used During Construction, PFUDC, as approved under the IROR Scheme, was calculated monthly at a rate of 11.7 per cent per annum, compounded annually.

For more details of the estimates for Zones 7 and 8 as filed, see Tables 3 and 4 respectively. These tables also include summaries of adjustments required by the Board, the reasons for which are contained in the sections which follow. All costs have been extended to a Revised Total for each zone with the exception of PFUDC. This particular component cannot be completed until the Company has applied the adjustments to its estimates of expenditure by month, at which time the Company is required to recalculate the PFUDC for each zone and file the adjusted estimates with the Board along with detailed working papers of the calculation.

1.1 Direct Costs

In examining the estimates, those items not based on firm bid prices were examined in greater depth than those for which a bid price had been obtained, with the direct costs (materials and installation) being dealt with separately from the indirect costs (project management, contingencies etc.).

The Company's method of preparing the estimates was generally based on a "built up" principle, i.e. the basic hourly rate was applied to the number of hours needed by the various crews to complete the project. These details were examined, together with the estimated cost of equipment and labour benefits such as overtime, bonuses and travel time.

The Board has reviewed the direct costs for Zone 7, totalling $50,881,000, and found them to be reasonable.

The Board has reviewed the direct costs for Zone 8, totalling $55,677,000, and, apart from the meter station estimated cost, comments on which follow, found them to be reasonable.

Decision

Subject to the reductions required for the meter station, the direct cost estimates are approved as filed.

1.1.1 Kingsgate Meter Station

The Company stated that, in the preparation of its cost estimate for the meter station, it had adopted the method of estimating as shown in Page and Nation's "Estimators Piping Man Hour Manual".

TABLE 3

FINAL DESIGN COST ESTIMATES
SEPTEMBER 1980 - Revised
- ZONE 7 -
($000)

Item	As Filed	Adjustments: Applied for by the Company	Adjustments: Disallowed Per these Reasons	Revised Total	Reference: Section	Reference: Table
Direct Costs						
Pipeline						
- Major Materials	$31,877	$ --	$ --	$31,877		
- Installations	15,704	--	--	15,704		
- Land and Land Rights	2,604	--	--	2,604		
- Supervision and Inspection	610	--	--	610		
- Support Facilities	23	--	--	23		
- Commissioning	63	--	--	63		
Total Directs	50,881	--	--	50,881		
Indirect Costs						
Project Management - Foothills (Alta.)	9,435	--	--	9,435		
Contingency	6,066	--	(1,179)	4,887	1.3	6
Foothills (Yukon)	15,168	(2,743)	(66)	12,359	1.4	8
Total Indirects	30,669	(2,743)	(1,245)	26,681		
Total Directs and Indirects before PFUDC	$81,550	$(2,743)	$(1,245)	$77,562		
PFUDC *	7,904					
Total Zone 7	$89,454					

* Subject to recalculation by Foothills (Yukon)

TABLE 4

FINAL DESIGN COST ESTIMATES
SEPTEMBER 1980 - Revised
- ZONE 8 -
($000)

Item	As Filed	Adjustments: Applied for by the Company	Adjustments: Disallowed Per these Reasons	Revised Total	Reference Section	Reference Table
Direct Costs						
Pipeline						
- Material	$19,389	$ --	$ --	$19,389		
- Installation	28,509	--	--	28,509		
- Land and Land Rights	607	--	--	607		
- Supervision and Inspection	1,131	--	--	1,131		
Compressor Station						
- Materials	698	--	--	698		
- Installation	10	--	--	10		
- Supervision and Inspection	2	--	--	2		
Meter Station No. 81						
- Materials	1,995	--	--	1,995		
- Installation	2,671	--	(549)	2,122	1.1.1	-
- Supervision and Inspection	142	--	--	142		
Support Facilities	32	--	--	32		
Commissioning Costs	491	--	--	491		
Total Directs	55,677	--	(549)	55,128		
Indirect Costs						
Project Management - Foothills (South B.C.)	2,022	--	--	2,022		
Contingency	5,850	--	(1,187)	4,663	1.3	6
Foothills (Yukon)	9,884	(4,309)	(55)	5,520	1.4	8
Total Indirects	17,756	(4,309)	(1,242)	12,205		
Total Directs and Indirects before PFUDC	$73,433	$(4,309)	$(1,791)	$67,333		
PFUDC*	4,492					
Total Zone 8	$77,925					

* Subject to recalculation by Foothills (Yukon)

TABLE 4

This manual contains tables of the number of man-hours required to complete numerous operations in the fabrication of pipes and fittings and other related activities.

An estimate based on the use of these man-hour tables gives the number of direct man-hours required to complete a project assuming a productivity rate of 70 per cent. The productivity rate is arrived at by considering six key factors or operations which affect productivity and by assigning to each operation a percentage efficiency rating based on experience or local knowledge. In the manual, these assigned percentages give an average of 70 per cent and the man-hour tables are made up using this average productivity rate.

In preparing its estimate, the Company varied the method used in the manual.

The manual indicates six key operations which affect productivity namely, general economy, project supervision, labour relations, job conditions, equipment and weather. The Company assigned a percentage efficiency rating to five of these six operations, excluding the labour relations factor, averaged these and arrived at a percentage efficiency figure for southern British Columbia of 57 per cent for the five operations.

This percentage efficiency was then compared to the average 70 per cent and applied to a calculated wage rate to increase the level from $19.85 to $22.43 per hour, exclusive of subsistence.

Direct man-hours for each activity were taken from the manual. The Company then assigned a percentage efficiency to the sixth key operation i.e. labour relations, and separately divided the direct man-hours for each activity by this percentage to arrive at the number of actual man-hours required to complete that activity.

Using these two elements, the Company developed each section of its estimate by converting the initial cost of individual items to man-hours, applying the labour relations percentage efficiency as discussed (usually 50 per cent for South B.C.), then adding subsistence, equipment costs and contractors profit to arrive at the installation cost estimate.

In summary, the Company utilized an increased wage rate reflecting five of the efficiency percentages, and a high number of man-hours resulting from the application of the sixth as the basis of its cost estimates.

For example, the following calculation is taken from the Foothills working papers on the erection of a building:

Quoted Cost of material & installation		$11,250
Conversion to man-hours $\frac{\$11,250}{\$22.43}$	= 502 man-hours	
Apply B.C. labour efficiency factor 50%	= 1,004 man-hours	
Revised Basic Cost - 1,004 hours @ $22.43/hour		$23,000
Pro-rated equipment cost (not specified)		6,000
Subsistence 100 man days @ $40/day		4,000
Contractors Profit and Overhead = 55%		18,000
Increase 9% (4th Qtr. 1979 $ to 1st Qtr. 1980 $)		5,000
TOTAL		$56,000

It can be seen that a building which was originally quoted at approximately $11,000 is now estimated to cost approximately $56,000, an increase of five times.

Similarly, the electricial work, quoted as $14,362, excluding materials, was factored up to $56,000 excluding materials, an increase of four times. In this case, although an efficiency factor of 25 per cent was identified, the calculations were based on 40 per cent.

During the hearing the Company quoted a concrete cost at $1,200/cu. yd., yet the cost as presented in the estimates was approximately $2,500/cu. yd., double the amount. In cross-examination, the Company could not explain these increases of between two and five fold, other than stating they were "anomalies".

The final figure for the total project for actual man-hours utilizing the above process increased from 22,840 to 53,779.

The Board cannot accept the validity of this method of calculation as, by separately dividing the direct man-hours by the percentage efficiency figure (40 per cent to 50 per cent) for the

labour relation element instead of using it in the average with the other five elements, the labour relations element assumes importance equal to the average of the other five. This has the effect of increasing the actual man-hours by a factor of 2 to 2 1/2.

In the case of the high pressure gas systems, the Board accepts the Company's estimate on the basis of the Company's explanation that the work must be completed in and around operating high pressure systems, and that extra tests and welds must be made because of the number of valves and tie-ins.

Decision

If the Company had followed the method outlined in Page and Nation's Manual, the incorporation of the labour relations percentage into the average would have resulted in an overall average of approximately 51 per cent. The Board would prefer that this had been done. The same result can be approximated if the Company's submitted estimates are halved, and, with the exception of the high pressure gas system, the Board directs that that be done. The estimate for the high pressure gas system is accepted as filed.

The reduction in the estimated costs for installation of the station, excluding the high pressure gas systems, will be $549,000, plus a reduction in the installation contingency of $55,000 (10 per cent).

1.2 Project Management

The Board has reviewed these cost estimates for Zones 7 and 8, and finds them reasonable. The Board therefore approves these cost estimates.

1.3 Contingencies

The following provisions for contingencies were included in the cost estimates for Zones 7 and 8, as per pages 49, 57 and 60 of Exhibit 4:

TABLE 5
($000)

Zone 7	Contingency Provision	
Direct Costs		
6% of Pipeline Materials, etc.)		
6% of Labour, Pipeline Installation, etc.)	$3,052	
Indirect Costs		
30% of Project Management	1,877	
Schedule Contingency	1,137	$6,066
Zone 8		
Direct Costs		
5% of Pipeline Materials, etc.	$1,161	
10% of Labour, Pipeline Installation, etc.	3,247	
Indirect Costs		
10% of Project Management	154	
Schedule Contingency	1,288	$ 5,850
		$11,916

The Board requires that the following adjustments be made for reasons given in succeeding sections:

TABLE 6
($000)

	Zone 7	Zone 8	Total Reduction
Material Contingency	$(1,179)	$ (488)	$ (1,667)
Installation Contingency		(55)	(55)
Schedule Contingency	-	(644)	(644)
	$(1,179)	$(1,187)	$ (2,366)
Total Contingency As Adjusted	$ 4,887	$ 4,663	$ $9,550

1.3.1 Materials Contingency

A contingency of 6 per cent was added to the materials item in the cost estimates for Zone 7, and 5 per cent for Zone 8. Historically, percentages of this magnitude have been applied when estimating in the absence of firm bid prices.

The contingency allowance would cover supply interruptions, and unexpected variations in quantities and scheduling. Should the Company have to obtain material from a supplier other than the one

from whom firm bids were received, any additional cost would be covered by the contingency allowance.

Two suppliers provided firm prices for line pipe and the Company was able to "build in" a safety margin by using, for estimating purposes, the higher of the two bids.

A further allowance was added by including additional pipe in the estimate for wastage.

The Board notes that firm prices were negotiated and a contract for supply of pipe was signed before the estimate was prepared and these firm prices were used as a basis for the estimate. Therefore, the risk of supply interruption and the effects of quantity problems were greatly reduced.

The use of the higher of the bid prices for estimating purposes provides a safety margin in costs which could be considered as a contingency. The wastage allowance removed most of the risk of quantities being underestimated.

In view of these reduced risks, the Board does not accept the need for the application of the historic 6 per cent or 5 per cent contingency to the estimated cost of line pipe.

Decision

The Board considers that, in view of the reduced risk, the contingency applied to line pipe should be reduced to 2 per cent for both zones. The contingency provision applied to line pipe shall therefore be reduced as follows:

TABLE 7

Zone	Cost of Line Pipe ($000)	Contingency Provision As Filed	Contingency Provision Reduced to	Reduction ($000)
7	$29,478	6%	2%	$1,179
8	16,277	5%	2%	488
Total Reduction				$1,667

1.3.2 Installation Contingency

For an explanation of the reduction in installation contingency for Zone 8 as noted above, refer to the decision in section 1.1.1 relating to the Kingsgate Meter Station. A reduction in the meter station installation estimates resulted in a corresponding reduction in contingency.

1.3.3 Schedule Contingency

1.3.3.1 Schedule Contingency - Zone 7

When submitting the FDCE, the Company included a construction schedule which showed that pipeline installation would commence on 15 July and would be completed by 30 September 1980.

A schedule contingency was also included in the FDCE to cover possible delays in the start of construction which could result in some part of the project being completed in winter conditions.

At the time of filing it was already known that regulatory approval was not granted on the expected date and the original schedule was delayed by one month, with the result that the forecast completion date for the pipeline installation slipped to 31 October and project completion date to 15 November 1980.

The Company was of the opinion that the one month delay in the schedule created a month of winter construction and, therefore, a sum of $1,137,000 should be applied as a contingency due to schedule delays.

Decision

Under the circumstances, the Board agrees that it is reasonable to include a schedule contingency and finds the amount to be reasonable. The schedule contingency for Zone 7 is, therefore, approved.

1.3.3.2 Schedule Contingency - Zone 8

In the FDCE for Zone 8, the Company included a schedule contingency to provide for cost increases in the event that delays extended the construction period into the winter months.

At the time of filing, it was known that regulatory approval was not granted on the expected date, but it was also known that no delay in the start of the construction schedule was experienced as the Company had commenced construction on the planned date.

The purpose of the schedule contingency was not applicable, therefore, in this instance as there were no delays to cause the construction schedule to be extended into winter months. The Company, however, claimed during cross-examination that, because the regulatory approval was delayed, extra costs were incurred to expedite crews into the field in less than two weeks to meet the original scheduled start of construction.

The Company gave no details of the increased cost of speeding up the mobilization of, and expediting of, crews into the field but suggested that the schedule contingency of $1,288,000 should be applied to offset these costs. The Board is aware that such activities would incur additional costs over normal procedures.

In view of the lack of evidence regarding the actual costs of expediting crews to the field and realizing that some additional costs were incurred, the Board judges that a reasonable estimate of these costs can be based on the two-week period the Company needed to meet the construction schedule deadline.

Decision

The Board recognizes that some allowance must be made for the increased costs of expediting construction crews into the field but cannot accept $1,288,000 as a reasonable estimate of these costs.

The Board will allow half this amount, $644,000, for these increased costs.

1.3.4 Project Management - Contingency

This contingency relates to the Project Management costs mentioned in section 1.2. The Board has found these estimates reasonable and approves them.

1.4 Foothills (Yukon) Costs

During the hearing, the Company reduced its estimate of Foothills (Yukon) costs for Zone 7 from the $15,168,000 shown in its filing of September 1980, by $2,743,000, excluding a further adjustment for PFUDC. These adjustments are summarized in Table 8.

Similarly, for Zone 8, the estimate of Foothills (Yukon) costs of $9,844,000 was reduced by $4,309,000. These adjustments are also summarized in Table 8.

For both Zones 7 and 8, the Company agreed during cross-examination that a further reduction of $170,000 should have been made to the 1980 Foothills (Yukon) cost estimates. This represents an amount for employee benefits which should have been charged directly to Foothills (South Yukon). A Board estimate of the allocation of part of this $170,000 to Zones 7 and 8 is also shown on Table 8.

Decision

The Board has reviewed these adjustments and accepts them. The Board approves the Foothills (Yukon) cost estimates as adjusted.

The allocation of costs to Zones 7 and 8 will require further adjustment due to the reductions in the total estimates for Direct Costs, Project Management and Contingencies identified in this chapter, which total for each Zone is the base for the allocation as approved in Chapter 4. Accordingly the Board will require that the Company include in its refiling of the FDCE for Zones 7 and 8, a recalculation of the allocations of Foothills (Yukon) costs.

TABLE 8

FOOTHILLS (YUKON) COSTS

($000)

	Zone 7	Zone 8
Foothills (Yukon) Costs (per Sept/80 filing)	$15,168	$9,884
Adjustments filed		
To use FDCE Value (1)	467	(780)
Remove NPA/NEB 1979 (2)	(1,322)	(199)
1980 Budget Changes (3)	(665)	(554)
1980 Allocation Methodology (4)	(1,252)	(2,922)
1981 Estimate Changes (5)	29	146
Sub Total	(2,743)	(4,309)
Allocable portion of employee benefit costs of $170,000 (allocation to Zone estimated by Board)	(66)	(55)
Net Adjustment	(2,809)	(4,364)
Revised Foothills (Yukon) Costs	$12,359	$5,520

EXPLANATIONS

(1) To use FDCE values rather than the 1980/1981 budget values.

(2) Foothills (Yukon) values for 1979 should not include NEB/NPA costs.

(3) The 1980 budget for Foothills (Yukon) is reduced by:
(A) Drafting Services $57,000
(B) South Yukon Management $1,308,000
(C) North Yukon Programs $174,000
The allocable portion is shown as an adjustment.

(4) FDCE allocations originally based on a 12 month period, revised based on two periods of 7 and 5 months.

(5) Foothills (Yukon) project management estimates for 1981 adjusted to include contingency allowance.

1.5 Adjustments to the Final Design Cost Estimates for Measures Required by the Northern Pipeline Agency

The Company submitted estimates of the One-Time Adjustment under the IROR Scheme to the rate bases of Foothills (Alta.) - Zone 7, and Foothills (South B.C.) - Zone 8, which are discussed in Chapter 9. Included in this filing were adjustments of the FDCE for Zones 7 and 8 to allow for additional costs incurred during construction due to a number of unforeseen events, as follows:

Zone 7	Retesting of Test Heads	$ 23,000
Zone 8	Re-X-Raying 238 Welds	$ 59,400
	Shutdown of Ditching Operations	78,000
	Retesting of Test Heads	31,200
		$168,600

The Company applied for these increases in the FDCE as the additional costs arose from extra work required by the NPA. The Company claimed that these measures ordered by the NPA were not required by the specifications and practices adopted by the Company and approved by the NPA at an earlier stage.

Decision

On the basis of the evidence submitted, the Board is not prepared to allow the inclusion of the subject cost in the FDCE. Accordingly, their inclusion is disallowed.

2. FINAL DESIGN COST ESTIMATES FOR PREBUILD FACILITIES IN ZONES 6 AND 9 FOR INCENTIVE RATE OF RETURN PURPOSES

Zones 6 and 9 of the Alaska Highway Gas Pipeline Project form that portion of the project known as the Eastern Leg, which will run from Caroline, Alberta, to Monchy, Saskatchewan. Planned construction of the Eastern Leg is scheduled for completion in two years, 1981 and 1982, with a single 1067 mm diameter pipe providing a throughput of $25.4 \times 10^6 m^3$/day in September 1982, increasing to $29.6 \times 10^6 m^3$/day in November 1982. One compressor station will be built in Alberta (Zone 6), two compressor stations will be constructed in Saskatchewan (Zone 9), and a meter station will be built at Monchy to measure the gas flow. One of the compressor stations, No. 367, in Alberta, will house two prime movers, an aero-derivative gas turbine and a large electric motor. The other compressor stations will house gas turbine units.

A construction schedule, details and submitted cost estimates for the Eastern Leg are as follows:

TABLE 9

Zone	Year	Pipeline Length km	Pipeline Diameter mm	Compressor Station Nos.	Total Cost ($000)
6 Alberta	1981 1982	170.6 206.9	1067 1067	367	$361,319
9 Saskatchewan	1981 1982	257.9 -	1067 -	392,394	292,623(1)
Total		635.4			$653,942

(1) Includes the meter station at Monchy, Saskatchewan.

NOTE: Construction of the meter station and three compressor stations is scheduled over two years.

The following is a summary of the cost components:

TABLE 10

($000)

	Zone 6	Zone 9	Total
Direct Costs	$266,327	$211,429	$477,756
Project Management	14,511	10,390	24,901
Contingency	29,489	22,497	51,986
Foothills (Yukon)	14,728	10,910	25,638
Sub-Total before PFUDC	325,055	255,226	580,281
PFUDC	36,264	37,397	73,661
Total	$361,319	$292,623	$653,942

For purposes of the IROR Scheme, though the estimates provide details of expenditures by quarter covering the construction period from early 1981 to 4th quarter 1982, all costs are in constant dollars of the base period. For the purpose of prebuilding in Zones 6 and 9, the Company selected December 1980 as the base period. PFUDC, as approved under the IROR Scheme, was calculated monthly at a rate of 11.7 per cent per annum, compounded annually.

For more details of the estimates for Zones 6 and 9 as filed, see Tables 11 and 12 respectively. These, and tables 13 through 16 also include summaries of adjustments required by the Board, the reasons for which are contained in the sections which follow. All costs have been extended to a Revised Total for each zone with the exception of PFUDC. This particular component cannot be completed until the Company has applied the adjustments to its estimates of expenditure by month, at which time the Company is required to recalculate the PFUDC for each zone and file the adjusted estimates with the Board along with detailed working papers of the calculation.

TABLE 11

FINAL DESIGN COST ESTIMATES
- ZONE 6 -
($000)

Item	As Filed	Adjustments: Applied for by the Company	Adjustments: Disallowed Per these Reasons	Revised Total	Reference Section	Reference Table
Direct Costs						
Pipeline						
- Material	$132,370	$ --	$ --	$132,370		
- Land and Land Rights	4,323	--	--	4,323		
Mainline - Section No. 261						
- Installation	37,625	344	(2,825)	35,144	2.1	13
- Supervision and Inspection	826	200	--	1,026	2.1	-
Mainline - Section No. 262						
- Installation	24,605	--	(2,615)	21,990	-	13
- Supervision and Inspection	631	--	--	631		
Mainline - Section No. 263						
- Installation	25,081	--	(2,615)	22,466	-	13
- Supervision and Inspection	631	--	--	631		
Mainline - Section No. 266						
- Installation	1,997	50	(147)	1,900	2.1	13
- Supervision and Inspection	231	--	--	231		
S. Saskatchewan River Crossing - Section No. 280						
- Installation	3,642	--	(756)	2,886	-	15
- Supervision and Inspection	132	--	--	132		
Compressor Station No. 367						
- Materials	21,496	--	--	21,496		
- Installation	9,791	--	(2,022)	7,769	-	16
- Land Rights	14	--	--	14		
- Supervision and Inspection	1,551	--	--	1,551		
Communication Facilities	841	--	--	841		
Support Facilities						
- Installation	118	--	--	118		
- Land and Land Rights	120	--	--	120		
Commissioning Costs	301	--	--	301		
Total Directs	266,327 **	594	(10,980)	255,941 **		
Indirect Costs						
Project Management - Foothills (Alta.)	14,511	--	--	14,511		
Contingency	29,489	--	(6,321)	23,168	2.3	28
Foothills (Yukon)	14,728	(723)	--	14,005	2.4	30
Total Indirects	58,728	(723)	(6,321)	51,684		
Total Directs and Indirects before PFUDC	$325,055	$(129)	$(17,301)	$307,625		
PFUDC*	36,264					
Total Zone 6	$361,319					

* Subject to recalculation by Foothills (Yukon)
** Inconsistency of Totals due to rounding.

TABLE 11

TABLE 12

FINAL DESIGN COST ESTIMATES
- ZONE 9 -
($000)

Item	As Filed	Adjustments: Applied for by the Company	Adjustments: Disallowed Per these Reasons	Revised Total	Reference Section	Reference Table
Direct Costs						
Pipeline						
- Material	$95,977	$ 573	$ --	$96,550	2.1	-
- Land and Land Rights	2,972	--	--	2,972		
Section No. 296						
- Installation	37,826	--	(3,137)	34,689	-	14
- Supervision and Inspection	1,016	--	--	1,016		
Section No. 297						
- Installation	23,812	--	(1,904)	21,908	-	14
- Supervision and Inspection	1,019	--	--	1,019		
Compressor Station						
Station No. 392						
- Major Material	14,346	--	--	14,346		
- Installation	6,013	--	(567)	5,446	-	16
- Land and Land Rights	12	--	--	12		
- Supervision and Inspection	701	--	--	701		
Station No. 394						
- Major Material	13,919	--	--	13,919		
- Installation	6,519	--	(567)	5,952	-	16
- Land and Land Rights	5	--	--	5		
- Supervision and Inspection	701	--	--	701		
Meter Station No. 91						
- Major Materials	3,143	--	--	3,143		
- Installation	1,100	--	--	1,100		
- Supervision and Inspection	72	--	--	72		
O & M Facilities	1,760	--	--	1,760		
Construction Support Facilities						
- Installation	69	--	--	69		
- Land and Land Rights	84	--	--	84		
Commissioning Cost Prior to Service	362	--	--	362		
Total Directs	211,429 **	573	(6,175)	205,827 **		
Indirect Costs						
Project Management - Foothills (Sask.)	10,390	--	--	10,390		
Contingency	22,497	--	(4,320)	18,177	2.3	28
Foothills (Yukon)	10,910	(203)	--	10,707	2.4	30
Total Indirects	43,797	(203)	(4,320)	39,274		
Total Directs and Indirects before PFUDC	$255,226	$370	$(10,495)	$245,101		
PFUDC*	37,397					
Total Zone 9	$292,623					

* Subject to recalculation by Foothills (Yukon)
** Inconsistency of Totals due to rounding.

TABLE 12

TABLE 13

DETAILED SUMMARY

THE ALASKA HIGHWAY GAS PIPELINE PROJECT
FINAL DESIGN ESTIMATE - DECEMBER 1980
PHASE I - (PREBUILD)

EASTERN LEG

ZONE 6
Mainline Sections
($000)

Installation		No. 261	No. 262	No. 263	No. 266	Reference Section	Reference Table
WBS202	Clearing	$ 120	$ -	$ -	$ -		
203	Top Soil Preservation	1,201	475	480	12		
205	Grade and Drainage Control	1,568	858	885	79		
207	Ditch	1,266	819	843	73		
210	Pipework (incl. Contractor Allow.)	2,780	2,615	2,615	147		
211	Stringing	1,300	817	869	80		
212	Bending and Set-Up	1,109	717	739	64		
213	Line-Up	3,482	2,251	2,320	200		
214	Welding	4,744	3,066	3,159	275		
215	Coat and Wrap	1,091	706	726	63		
216	Tie-In and Block Valves	4,121	3,097	2,514	219		
217	Clean-Up and Restoration	1,836	1,150	1,181	101		
218	Hydrostatic Testing	3,422	2,210	2,287	210		
221	Water Crossings	950	-	-	-		
223	Valve Assemblies	678	312	721	67		
224	Lower-In	772	500	514	45		
225	Backfill	536	346	356	31		
251	Mobilize and Demobilize	471	422	519	25		
255	Supervisory - Administration	4,769	3,326	3,431	233		
270	Survey	565	347	347	24		
275	X-Ray	644	421	424	36		
280	Revegetation	229	150	151	13		
284	Line Lowering	315	-	-	50		
		$37,969*	$24,605	$25,081	$2,047*		
Disallowed as per these reasons:							
	Top Soil Preservation	(45)	-	-	-	2.1.3	21
	Contractor Allowance	(2,780)	(2,615)	(2,615)	(147)	2.1.7	26
		(2,825)	(2,615)	(2,615)	(147)		
Revised Total Installation		$35,144	$21,990	$22,466	$1,900		

* Includes adjustments requested by Foothills (Yukon).
WBS: Work Breakdown Structure

TABLE 14

DETAILED SUMMARY

THE ALASKA HIGHWAY GAS PIPELINE PROJECT
FINAL DESIGN ESTIMATE - DECEMBER 1980
PHASE I - (PREBUILD)

EASTERN LEG

Installation		ZONE 9 Mainline Sections ($000) No. 296	No. 297	Reference Section	Table
WBS203	Top Soil Preservation	$ 765	$ 744		
205	Grade and Drainage Control	1,545	710		
207	Ditch	1,384	697		
210	Pipework (incl. Contractor Allowance)	2,724	1,699		
211	Stringing	1,517	894		
212	Bending and Set-Up	1,201	594		
213	Line-Up	3,522	1,791		
214	Welding	5,050	2,465		
215	Coat and Wrap	1,178	574		
216	Tie-In and Block Valves	4,094	2,066		
217	Clean-Up and Restoration	1,913	964		
218	Hydrostatic Testing	3,769	1,906		
223	Valve Assemblies	683	500		
224	Lower-In	855	444		
225	Backfill	589	294		
250	Dedicated Camp	-	3,096		
251	Mobilize and Demobilize	506	532		
255	Supervisory-Administration	5,046	2,768		
270	Survey	556	561		
275	X-Ray	684	380		
280	Revegetation	245	133		
		$37,826	$23,812		
Disallowed as per these reasons:					
	Top Soil Preservation	(413)	(205)	2.1.3	21
	Contractor Allowance	(2,724)	(1,699)	2.1.7	26
		(3,137)	(1,904)		
Revised Total Installation		$34,689	$21,908		

WBS: Work Breakdown Structure

TABLE 14

TABLE 15

DETAILED SUMMARY

THE ALASKA HIGHWAY GAS PIPELINE PROJECT
FINAL DESIGN ESTIMATE - DECEMBER 1980
PHASE I - EASTERN LEG (PREBUILD)

EASTERN LEG

Installation		ZONE 6 S. Saskatchewan River Crossing Section No. 280 ($000)	Reference Section	Table
WBS203	Top Soil Preservation	$ 42		
205	Grade and Drainage Control	17		
207	Ditch	19		
210	Pipework (incl. Contractor Allowance)	1,003		
211	Stringing	30		
212	Bending and Set-Up	22		
213	Line-Up	45		
214	Welding	67		
215	Coat and Wrap	28		
216	Tie-In and Block Valves	48		
217	Clean-Up and Restoration	232		
218	Pigging, Test and Tie-In	128		
224	Lower-In	20		
225	Backfill	13		
231	Crossing Excavation	1,772		
251	Mobilization and Demobilization	75		
255	Supervisory - Administration	44		
270	Survey	14		
275	X-Ray	15		
280	Revegetation	8		
		$3,642		
Disallowed as per these reasons:				
	Top Soil Preservation	(28)	2.1.3	21
	River Crossing Labour	(456)	2.1.2	
	Contractor Allowance	(272)	2.1.7	26
		(756)		
Revised Total Installation		$2,886		

WBS: Work Breakdown Structure

TABLE 15

TABLE 16

DETAILED SUMMARY

THE ALASKA HIGHWAY GAS PIPELINE PROJECT
FINAL DESIGN ESTIMATE - DECEMBER 1980
PHASE I - EASTERN LEG (PREBUILD)

		COMPRESSOR STATIONS			Reference
		ZONE 9		ZONE 6	Section/Table
Installation		No. 394	No. 392	No. 367	
WBS201	Sitework	$1,081	$ 608	$ 629	
202	Concrete	961	1,115	1,976	
203	Buildings and Structure	105	105	145	
205	Compressor Drivers	273	266	1,158	
206	H.P. Gas System	1,488	1,346	1,831	
207	Fuel, Utility and Power Gas	321	335	478	
208	Cooling Water	26	24	19	
209	Fresh and Fire Water	36	36	42	
210	Compressed Air	124	121	125	
211	Lube, Seal, Hydraulic Oil	164	160	284	
212	Instrumentation	392	392	610	
213	Freeair and Exhaust	-	-	100	
214	Heating	273	266	364	
215	Sanitary and Storm Sewer	184	179	166	
216	Control and Logic	69	69	69	
217	Electrical	462	431	1,235	
219	Aerial Cooling	560	560	560	
Total Installation		$6,519	$6,013	$9,791	
Disallowed as per these reasons:					
Hourly Rate		(436)	(470)	(573)	2.1.4 -
Electrically Driven Compressor		-	-	(585)	2.1.5 -
Concrete		(131)	(97)	(864)	2.1.6 -
		(567)	(567)	(2,022)	
Revised Total Installation		$5,952	$5,446	$7,769	

WBS: Work Breakdown Structure

2.1 Direct Costs

The Company's method of preparing the estimates and the degree to which the direct costs have been examined in detail has been explained in Chapter 1, section 1.1.

During the hearing, the Company adjusted the estimates of Direct Costs for Zones 6 and 9 by the addition of the following amounts:

TABLE 17

($000)

			Zone 6	Zone 9
Direct Costs as filed			$266,327	$211,429
Additions by Company				
Zone	Section No.			
6	261	WBS270 Survey	194	
		WBS284 Line Lowering	150	
		WBS900 Field Inspection	200	
	266	WBS284 Line Lowering	50	
			594	
9	290	WBS115 Mill Inspection		573
		Adjusted Total	$266,921	$212,002

Decision

The Board has reviewed these adjustments and accepts them. The Board has reviewed the total direct cost for Zone 6 and Zone 9 of $266,921 and $212,002 respectively, as adjusted, and approves them subject to the reductions explained in succeeding sections.

2.1.1 Summary of Reductions

The Board requires that the following adjustments be made for reasons given in succeeding sections:

TABLE 18

($000)

Zone	Item	Direct Cost Reduction	Contingency Reduction
ZONE 6	River Crossing	$ 456	$ 68
	Top Soil Preservation	73	11
	Compressor Stn. - Hourly Rate	573	86
	Compressor Installation Costs	585	88
	Compressor Stn. - Concrete Quantity	864	130
	Contractor Allowance	8,429	1,265
		$10,980	$1,648
ZONE 9	Top Soil Preservation	618	93
	Compressor Stn. - Hourly Rate	906	136
	Compressor Stn. - Concrete Quantity	228	34
	Contractor Allowance	4,423	663
		$ 6,175	$ 926
	TOTAL	$17,155	$2,574

The following issues were examined but the estimated costs were not adjusted.

(i) Productivity - Installation Costs

(ii) Site Preparation Costs

(iii) Spare Parts - Compressor Units

(iv) Compressor Stations

Erection Costs
Free Air Exhaust
High Pressure Pumping

2.1.2 River Crossings - Zone 6

A cost estimate for the South Saskatchewan River crossing shows that the total length of 5,400 metres of pipe is divided into two parts, a 3,800-metre section on the flat prairie above the crossing and a 1,600-metre section which extends from "top of bank to top of bank" across the river. The construction schedule for the total river crossing length shows that "line up and welding" will be completed between 23 July and 15 August, some 24 calendar days or a maximum of 22 working days. The schedule also shows that some

welding will be required until the end of the hydrostatic testing programme, a period of some 70 days between 23 July and 30 September.

Examination of the crew sizes and work periods for the 3,800-metre section shows that 10 welders and 10 helpers are scheduled to complete the section in six days at the rate of 550 metres per day (including 15 per cent down time). A small crew of 3 welders and 3 helpers is scheduled to complete the "tie-ins" for the 3,800-metre section in 10 days plus 15 per cent down time. The crew sizes, costs and construction schedule are considered reasonable for this 3,800-metre section of the project.

When the cost estimate for the 1,600-metre section was examined, the estimate details showed that 24 welders (12 journeymen and 12 stringer bead welders) and 14 helpers would be required for 60 days to complete this section. Under cross-examination the Company appeared surprised that 12 stringer bead welders were included in the welding crew and the presence of only 14 helpers tends to support the impression that the number of welders is excessive.

A comparison of the estimated sizes of the crews and work schedules employed on the two sections shows that while the 10 welders and 10 helpers can complete 3,800 metres in approximately six days, it requires 24 welders and 14 helpers working 60 days to complete 1,600 metres.

The Company stated that the bulk of the welders would be employed on the 1,600-metre section for approximately one month with a few welders being present for the whole duration. This time span of one month for the bulk of the welders is confirmed by the estimate details which show that the straw boss, or supervisor of the welders, will be present for 28 days and also by the construction schedule which allows 24 days for line-up and welding for the whole 5,400 metres.

The Company agreed that when the welders on the 1,600-metre section were not busy, they would join the welding crew on the 3,800-metre section on the flat above the river which is scheduled to be completed in six days. This is a further reason why it is difficult to extend the working period of these welders to the estimated 60 days schedule.

The Board judges that the evidence shows an over-estimate of both the number of welders required on the 1,600-metre section and the number of days work required to complete this section.

The filed estimate (Exhibit 16) of certain welding costs include:

Labour (lines 1 to 6, page 153)	$639,651
Welding rigs (lines 34 & 35, page 154)	68,150
Subsistence (2,316 man-days @ $38.50/day)	89,166
TOTAL	$796,967

On the basis of the above, the Board considers that the following would be a reasonable estimate of the labour and equipment required for the 1,600-metre section.

Labour and Equipment

(a) 12 welders, 12 helpers and 1 welding straw boss, for 22 working days. This along with the 6 days for the 3,800 metres beyond the top of banks provides the 28 working days suggested by the straw boss allowance;

(b) 5 welders and 5 helpers for 50 working days for tie-in work. This allowance, plus the 10 days for the tie-in crews on top, provides for 60 working days or about 70 calendar days;

(c) welding rigs and personnel subsistence in accordance with the above requirement.

The cost of this labour and equipment at the rates shown in the estimate would be:

TABLE 19

Amended Welding Estimate	Unit Cost	Total
12 journeymen for 22 days @	$272.83	$ 72,027
12 welder helpers for 22 days @	198.29	52,349
5 journeymen for 50 days @	272.83	68,208
5 welder helpers for 50 days @	198.23	49,557
1 straw boss for 28 days @	355.00	9,940
12 welding rigs for 22 days @	94.00	24,816
5 welding rigs for 50 days @	94.00	23,500
1,056 man-days subsistence @	38.50	40,656
TOTAL		$341,053

The total reduction in labour, equipment and subsistence costs is therefore:

Filed costs	$796,967
Amended Estimate	341,053
REDUCTION	$455,914

Decision

The Board directs that, based on the above estimate, the estimated installation costs for the 1,600-metre section of the River Crossing, Section 280, Zone 6, be reduced by $456,000 with a corresponding reduction in the installation contingency of $68,000 (15 per cent).

2.1.3 Top Soil Preservation

The Company submitted that, for the purpose of preparing the top soil preservation cost estimates for the 1981 pipeline construction in sections 261, 266, 280, 296, and 297 in Zones 6 and 9, the topographical features on the right-of-way were divided into three cost categories depending on the estimated amount of work required in each category to effectively preserve the top soil. The Company stated that the quantity estimates for terrain in each of the three categories were made during actual examination of the route, and that these estimates were then entered on their alignment sheets at the time of the examination.

These alignment sheets, submitted to the NPA as part of the Plan, Profile and Book of Reference, clearly indicated the Company's own quantity estimates for each of the three categories. However, as shown in Table 20 below for comparative purposes, the quantity estimates shown in the Company's alignment sheets do not agree with quantity estimates used in the preparation of the top soil preservation costs shown in the FDCE.

TABLE 20

COMPARISON OF TOP SOIL PRESERVATION QUANTITIES

SEC.	TOTAL KM	CATEGORY 1 $0.5/m		CATEGORY 2 $1.5/m		CATEGORY 3 $21/m	
		Alignment Sheets	FDCE	Alignment Sheets	FDCE	Alignment Sheets	FDCE
		(metres)		(metres)		(metres)	
261	53.8	22,600	-	29,000	43,000	2,200	10,800
264	103.5	28,900	26,000	27,000	37,500	47,600	40,000
266	7.9	600	-	7,300	7,900	-	-
280	3.1	2,100	-	400	-	600	2,000
296	167.0	66,900	32,000	91,500	107,000	8,600	28,000
297	90.9	30,100	18,000	38,600	42,000	22,200	32,000
TOTALS		151,200	76,000	193,800	237,400	81,200	112,800

In the lowest-cost top soil preservation category, priced at $0.50/m, the Company reduced the length by 50 per cent but it correspondingly increased the lengths of the more expensive categories 2 and 3, priced at $1.5/m and $21/m respectively, thus increasing the overall cost by $691,200. For details of the calculations see Table 21. The Board accepts the cost per metre, established for each of the three categories of top soil preservation for the section of the pipeline scheduled for 1981 completion.

Further, the Board considers the top soil preservation quantity estimates as shown on the alignment sheets, based on actual field inspection of the section done at the time of making the estimates, as more likely to reflect the actual quantities involved. The quantities stated in the cost estimates do not agree with the quantities established during field inspection and are, therefore, not acceptable.

Decision

The Board accepts the quantity estimates shown on the alignment sheets, prepared by the Company, and requires that the estimated cost for top soil preservation item as shown in the FDCE be reduced by $691,000, with a corresponding reduction of $104,000 (15 per cent) in the installation contingency allowance.

The above reduction results in an estimated average top soil preservation cost of $4.90/m for the 426 km of pipeline to be constructed in 1981.

TABLE 21

COMPARISON OF TOP SOIL PRESERVATION QUANTITIES BY COST CATEGORY

1981 CONSTRUCTION SCHEDULE

Zone/ Section			Category 1. @ $0.5/m		Category 2. @ $1.5/m		Category 3. @ $21.0/m		Total Difference		15% Contingency $(000)
			Distance km	Cost $(000)	Distance km	Cost $(000)	Distance km	Cost $(000)	Distance km	Cost $(000)	
6	261	Alignment Sheets	22.6	$11.3	29.0	$43.5	2.2	$46.2	53.8	$101.0	
		FDCE	-	-	43.0	64.5	10.8	226.8	53.8	291.3	
		Cost Difference		$11.3		$(21.0)		$(180.6)		$(190.3)	
	261*	Alignment Sheets	28.9	$14.5	27.0	$40.5	47.6	$999.6	103.5	$1,054.6	
		FDCE	26.0	13.0	37.5	56.3	40.0	840.0	103.5	909.3	
		Cost Difference		$1.5		$(15.8)		$159.6		$145.3	
	SUB TOTAL									$(45.0)	
	266	Alignment Sheets	.6	$0.3	7.3	$11.0	-	-	7.9	$11.3	
		FDCE	-	-	7.9	11.9	-	-	7.9	11.9	
		Cost Difference		$0.3		$(0.9)		-		$(0.6)	
	280**	Alignment Sheets	2.1	$1.1	0.4	$0.6	0.6	$12.6	3.1	$14.3	
		FDCE	-	-	-	-	2.0	42.0	2.0	42.0	
		Cost Difference		$1.1		$0.6		$(29.4)		$(27.7)	
	ZONE 6 TOTAL									$(73.3)	$(11.0)
9	296	Alignment Sheets	66.9	$33.5	91.5	$137.3	8.6	$180.6	167.0	$351.4	
		FDCE	32.0	16.0	107.0	160.5	28.0	588.0	167.0	764.5	
		Cost Difference		$17.5		$(23.2)		$(407.4)		$(413.1)	
	297	Alignment Sheets	30.1	$15.1	38.6	$57.9	22.2	$466.2	90.9	$539.2	
		FDCE	18.0	9.0	42.0	63.0	32.0	672.0	92.0	744.0	
		Cost Difference		$6.1		$(5.1)		$(205.8)		$(204.8)	
	ZONE 9 TOTAL									$(617.9)	(92.7)
	TOTAL COST DIFFERENCE									$(691.2)	$(103.7)

* Sometimes called 264.
** Prairie section of river crossing only.

The Company has estimated the 1982 construction costs as $955,000 for top soil preservation over 206.3 km in sections 262 and 263. This represents an average of $4.60/m which, when compared to the $4.90/m for the 1981 construction, appears reasonable and is accepted by the Board.

2.1.4 Compressor Stations - Direct Labour Hourly Rates

The Company updated a cost estimate for a typical compressor station, No. 42, as a basis for preparing the cost estimates for the three compressor stations on the Eastern Leg, Nos. 367, 392 and 394.

The estimate for the construction of Station 42 was based on building trade rates. The wage rates for the building trades specified by a two-year agreement reached in 1980 were available at the time of updating the Station 42 estimate. The cost estimate for Station 42 indicates that the May 1981 wage rates were used in the update.

Since the Station 42 estimate was used as a basis for the three compressor station estimates, they also reflect the use of the May 1981 wage rates.

The use of 1981 wage rates was incorrect since the estimates filed by the Company were stated to be in December 1980 dollars, as explained on page 2-2.

The differential between the 1980 and the May 1981 wage rate is 9.3 per cent, which, when applied to the labour component of the total installation costs of the Station 42 estimate, gives an increase of $420,000. The total estimated installation cost of Station 42 is $6,270,000 of which $420,000 represents 6.7 per cent, and the Board finds that the estimate is overstated by this percentage.

In calculating the costs of the consumables and small tool items, which are shown as percentages of the total direct costs, the Company applied the percentage to a base which is overstated due to the inclusion of the incorrect labour costs. To correct for this, the Board finds it reasonable to reduce the estimates by a further 0.3 per cent, for a total reduction of 7.0 per cent.

Decision

In view of the use of the incorrect wage rates in the fundamental cost estimate for Station 42, the Board considers that an overstatement in installation cost is included in each compressor station estimate developed from Station 42 estimates.

The Board, therefore, directs that installation costs for each compressor station be reduced by 7 per cent as follows:

		Reduction	Contingency 15%
ZONE 6	Station 367	$ 573,000	$ 86,000
ZONE 9	Station 392	470,000	136,000
	Station 394	436,000	
	TOTAL	$1,479,000	$222,000

2.1.5 Compressor Installation Costs

In the FDCE, the Company indicated that the installation costs for the compressors at the three compressor stations in the Eastern Leg of the pipeline project would be as follows:

TABLE 22

Station No.	Zone	Compressors	Installation Cost ($000)
367	6	1 Aero-Derivative Gas Turbine, and 1 Electrically Driven	$1,158
392	9	1 Industrial Gas Turbine	$ 266
394	9	1 Aero-Derivative Gas Turbine	$ 273

As the aero-derivative gas turbine driven compressor selected for Station 367 is similar to the gas turbine compressor selected for Station 394, for which installation was estimated to cost $273,000, the Company's estimate for the installation cost for the electrically driven compressor in Station No. 367 would appear to be $885,000 ($1,158,000 - $273,000). This amount, which is more than three times greater than the cost for installing a gas turbine driven compressor, is unlikely to be attributable to the extra electrical work associated with electrically driven compressors as it appears the estimate for electrical work in Station No. 367 is $773,000 higher than that for Station No. 394 ($1,235,000 - $462,000).

The Board is unaware of any design characteristics of the electrically driven compressor selected for this station that would cause the installation cost to be more than three times greater than the cost for the installation of an aero-derivative or industrial type gas turbine driven compressor. The Board notes that there is already a separate and additional \$100,000 shown for the installation cost of a free air exhaust, and \$773,000 for additional electrical work associated with the electrically driven compressor selected for Station No. 367. Under these circumstances, the Board feels that an amount of \$300,000 would be a reasonable estimate for the cost of installing the electrically driven compressor.

Decision

As the Board considers that an installation cost of \$300,000 would be a reasonable cost estimate for the installation of the electrically driven compressor in Station No. 367, the Board therefore directs that the estimate be reduced by \$585,000 (\$885,000 - \$300,000), with a corresponding reduction of \$88,000 (15 per cent) in the installation contingency allowances.

2.1.6 Concrete Quantity - Compressor Stations

Because of a duplication of the cooler foundation quantities in the estimates, the Company agreed in evidence that each station cost estimate should be reduced by \$45,000.

The working papers show that the volume of concrete for the foundation for Station 367 was calculated as 1,467 m^3 including the cooler foundation. The cost of this concrete is shown as \$789/m^3. In the final design cost estimate the quantity of concrete is shown as 1,467 m^3 but the total cost indicated is \$1,976,000, which would appear to be based on a cost of \$1,374/m^3. The Board finds that a reduction to the cost of \$789/m^3 shown in the working paper is warranted.

For this station, therefore, the calculation of the reduction should be:

TABLE 23

($000)

Station 367	Foothills estimate for 1,467 m^3		$1,976
(Zone 6)	Revised estimate:		
	1,467 m^3 @ $789/$m^3$	$1,157	
	Less cooler foundation duplication	45	1,112
	Net Reduction		$ 864

In the case of Station No. 394, the same procedure has been adopted so that a higher cost per cubic metre has been applied to the volume of concrete shown.

TABLE 24

($000)

Station 394	Foothills estimate for 1,109 m^3		$961
(Zone 9)	Revised estimate:		
	1,109 m^3 @ $789/$m^3$	$875	
	Less cooler foundation duplication	45	830
	Net Reduction		$131

The third station, No. 392, is to be built in an area where a high water table exists. Thus a deeper foundation is necessary using lean mix concrete as a sub foundation. The Company, in calculating its quantities, added the volume of the lean mix concrete (some 352 m^3) to the calculated volume for the general foundation (1,147 m^3) and applied the same cost for both. In evidence, the Company admitted that lean mix concrete is less expensive than normal concrete and estimated lean mix concrete at $450/$m^3$. The Board therefore finds that a proper estimate would be:

TABLE 25

($000)

Station 392			
(Zone 9)	Foothills estimate for 1,500 m^3		$1,115
	Revised estimate:		
	1147 m^3 standard concrete @ $789/$m^3$	$ 905	
	352 m^3 lean mix concrete @ $450/$m^3$	158	
		$1,063	
	Less cooler foundation duplication	45	1,018
	Net Reduction		$ 97

The total estimate reduction for all three stations is, therefore, $1,092,000.

Decision

The evidence shows that errors in calculations, together with the duplication of costs, have resulted in an over-estimate in the concrete quantities for the three compressor stations.

The Board directs that the cost estimates for the concrete in Compressor Station Nos. 367, 392, and 394 be reduced by $1,092,000 and that the installation contingency for these stations be reduced by $164,000 (15 per cent).

2.1.7 Contractor Allowance

Included in the cost of installation for each pipeline section was a provision for Contractor Allowance as follows:

TABLE 26

	Year of Installation	Pipeline Section	Contractor Allowance ($000)
Zone 6	1981	261	$2,780
	1981	266	147
	1981	280	272
	1982	262	2,615
	1982	263	2,615
			$8,429
Zone 9	1981	296	$2,724
	1981	297	1,699
			$4,423

A witness for the Company explained that the Company expects the rate of increase in the cost of labour, equipment, fuel oil and gas during the construction period will be higher than that reflected in the GNP Price Deflator. Under the terms of the IROR Scheme, the GNP Price Deflator will be used to reduce actual costs as

incurred to base period dollars for comparison with the FDCE. With that in mind, the Company included the Contractor Allowances to offset the impact of deflating the actual costs at a rate which the Company expects to be lower than the specific rate of inflation for this group of costs.

During Phase IV(a) of the tariff hearing, when Filed Capital Costs, contained in the Canada-U.S. Agreement, were replaced with the FDCE for purposes of measuring cost control performance under the IROR Scheme, it was clearly stated in paragraph 11, on page 28 of the Phase IV(a) Decision:

> "The final design costs for the prebuild facilities in these zones as approved by the Northern Pipeline Agency, and as accepted by the National Energy Board, expressed in constant dollars, i.e. <u>excluding any provision for inflation</u>, will replace the 'Filed Capital Costs' for cost performance measurement purposes ..." (emphasis added)

On the basis of the evidence led, the Board sees no reason to alter that decision at this time.

<u>Decision</u>

In view of the foregoing, the Board does not accept a provision for inflation, and therefore disallows the amounts listed above for inclusion in the FDCE for Zones 6 and 9 for IROR Scheme purposes, with a corresponding reduction in the contingency provision of $1,265,000 for Zone 6 and $663,000 for Zone 9 (15 per cent of Contractor Allowance).

2.2 <u>Project Management</u>

The Board has reviewed these cost estimates for Zones 6 and 9, and finds them reasonable. The Board, therefore, approves these cost estimates.

2.3 <u>Contingencies</u>

The following provisions for contingencies were included in the cost estimates for Zones 6 and 9, as per page 28 of Exhibit 16.

TABLE 27

($000)

Zone 6	Contingency Provision	
Direct Costs		
6% of Pipeline Materials, etc.	$ 9,232	
15% of Labour, Pipeline Installation, etc.	16,889	
Indirect Costs		
30% of Project Management	3,435	$29,556
Zone 9		
Direct Costs		
6% of Pipeline Materials, etc.	$ 7,678	
15% of Labour, Pipeline Installation, etc.	12,546	
Indirect Costs		
30% of Project Management	2,308	22,532
		$52,088

The Board requires that the following adjustments be made for reasons given in succeeding sections.

TABLE 28

CONTINGENCY REDUCTIONS

($000)

	Zone 6	Zone 9	Total Reduction
Material Contingency	$(4,673)	$(3,394)	$(8,067)
Installation Contingency			
River Crossing	$(68)	$ -	$ (68)
Topsoil Preservation	(11)	(93)	(104)
Hourly Rate	(86)	(136)	(222)
Compressor Installation	(88)	-	(88)
Concrete Quantity	(130)	(34)	(164)
Contractors Allowances	(1,265)	(663)	(1,928)
	$(1,648)	$(926)	$ (2,574)
Total Reduction	$(6,321)	$(4,320)	$(10,641)
Total Contingency as Adjusted	$23,235	$18,212	$ 41,447

2.3.1 Material Contingency

A contingency of 6 per cent was added to the materials item in the cost estimates for Zones 6 and 9.

The need for such a contingency provision and the special circumstances of this project were discussed in detail in Chapter 1, section 1.3.1.

In view of the reduced risk associated with line pipe, as explained therein, the Board does not accept the need for the application of the historic 6 per cent contingency to the estimated cost of line pipe for Zones 6 and 9.

Decision

The Board considers that the contingency applied to line pipe should be reduced to 2 per cent for both zones. The contingency provision applied to line pipe shall therefore be reduced as follows:

TABLE 29

Zone	Cost of Line Pipe ($000)	Contingency Provision As filed	Contingency Provision Reduced to	Reduction ($000)
6	$116,827	6%	2%	$4,673
9	$ 84,854	6%	2%	3,394
Total Reduction				$8,067

2.3.2 Installation Contingency

For an explanation of the reduction in installation contingencies listed above see the various decisions contained in section 2.1, in which reductions in estimates of direct costs result in reductions in the corresponding contingency items.

2.4 Foothills (Yukon) Costs

During the hearing, the Company reduced the estimates of Foothills (Yukon) costs for Zone 6 of $14,728,000 by $723,000. These adjustments are summarized in Table 30.

Similarly, the estimates for Zone 9 of $10,910,000 were reduced by $203,000. These adjustments are also summarized in Table 30.

Decision

The Board has reviewed these adjustments and accepts them. The Board approves the Foothills (Yukon) cost estimates as adjusted.

The allocation of costs to Zones 6 and 9 will require further adjustment due to the reductions in the total estimates for Direct Costs, Project Management and Contingencies identified in this chapter, which total for each Zone is the base for the allocation as approved in Chapter 4. Accordingly the Board will require that the

Company include in its refiling of the FDCE for Zones 7 and 8, a recalculation of the allocations of Foothills (Yukon) costs.

TABLE 30

FOOTHILLS (YUKON) COSTS

($000)

	Zone 6	Zone 9
Foothills (Yukon) Costs as filed	$14,728	$10,910
Adjustments filed		
Working Paper Discrepancies(1)	4	13
Contingency Reduction(2)	(727)	(216)
Net Adjustment	$ (723)	$ (203)
Revised Foothills (Yukon) Costs	$14,005	$10,707

EXPLANATIONS

(1) Revision in allocation.

(2) Foothills (Yukon) project management estimates include excessive contingency.

3. AMENDMENT TO THE EXPRESSION "SCOPE CHANGE" FOR INCENTIVE RATE OF RETURN

There is no clear definition of the expression "Scope Changes", but in the Board's Phase IV(a) Decision there is a statement on page 29 as follows:

> "The final design costs may be modified by scope changes mandated by the Northern Pipeline Agency after construction is underway."

Foothills (Yukon) asked the Board to indicate its willingness to permit additions to the FDCE on a basis wider than simply changes ordered by the NPA. The Company suggested that abnormal increases in costs caused by events that are beyond the Company's control, such as tornados or prolonged labour disputes, would be appropriate subjects for adjustments.

Decision

Having reviewed the matter, the Board does not consider it appropriate to expand the expression "scope changes" or to speculate on the nature of cost increases which might be permitted to be added to the FDCE. However, in the event of unusual circumstances, the Board is prepared to consider an application from the Company outlining the unforeseen events which caused increased costs. The Company would have to establish to the Board's satisfaction that the extra expenses incurred were beyond its control and that all reasonable attempts were made to prevent the cost overrun from occurring. The Company would also have to demonstrate to the Board that the FDCE contained no provision for these expenses.

PART II

ALLOCATIONS

4. ALLOCATION AMONG SUBSIDIARY COMPANIES OF ADMINISTRATIVE AND OTHER EXPENSES INCURRED BY FOOTHILLS (YUKON)

Foothills (Yukon) incurs both direct and indirect expenditures. The direct expenditures are, by their nature, directly allocable between prebuild and mainline and to zones. The Company proposed to allocate indirect charges to zones on the basis of overall direct expenditures in the period. The Company's position is that this system of allocation reflects, as accurately as is reasonably possible, where activity is actually taking place. The Board notes that the method of allocation has been in issue since June 1979 and that the Company's position has remained essentially unaltered. The Board has considered various schemes or methods of allocation, none of which appear to be any more appropriate than the Company's proposal.

Decision

Accordingly, the Board approves the Company's method of allocation of Foothills (Yukon) indirect expenditures.

PART III

RATE BASE MATTERS

5. PRELIMINARY AND CONSTRUCTION EXPENDITURES - 1980

5.1 Preliminary Expenditures - 1980

Foothills (Yukon) applied to include 1980 preliminary expenditures of $52,309,000 in its rate base and/or the rate bases of its subsidiaries. A summary of the 1980 preliminary expenditures, showing the Company's allocation of the expenditures between prebuild and mainline, follows.

TABLE 31

PRELIMINARY EXPENDITURES

($000)

	Phase 1 Prebuild	Phase 2 Mainline	Total Expenditures
Foothills (Yukon)	$ 7,978	$ 6,678	$14,656
Foothills (South Yukon)	-	7,921	7,921
Foothills (North B.C.)	-	1,643	1,643
Foothills (Alta.)	3,970	659	4,629
Foothills (South B.C.)	1,048	-	1,048
Foothills (Sask.)	1,147	60	1,207
Foothills (North Yukon)	-	107	107
NOVA	2,379	10,234	*12,613
Westcoast	1,752	6,187	* 7,939
ANG	85	461	* 546
	$18,359	$33,950	$52,309

*AFUDC only

No intervenors presented evidence or opposed the Foothills (Yukon) application to include these preliminary expenditures in rate base.

Decision

The Board accepts the preliminary expenditures incurred during 1980 of $52,309,000 for inclusion in the rate bases of Foothills (Yukon) and its subsidiaries, subject to the adjustments required by the remaining sections of this Chapter.

5.2 Construction Expenditures - 1 August to 31 December 1980

Foothills (Yukon) applied to include construction expenditures incurred during the period 1 August to 31 December 1980 of $105,779,000 in the rate bases of the Foothills (Yukon) subsidiaries involved in prebuild, as follows.

TABLE 32

CONSTRUCTION EXPENDITURES

($000)

	Direct Charges	Foothills (Yukon) Allocation	AFUDC	Total
Foothills (Alta.)				
Zone 6	$ 1,268	$ 66	$ 151	$ 1,485
Zone 7	48,653	2,541	1,409	52,603
	$49,921	$2,607	$1,560	$54,088
Foothills (South B.C.)				
Zone 8	46,354	2,421	1,330	50,105
Foothills (Sask.)				
Zone 9	1,370	74	142	1,586
	$97,645	$5,102	$3,032	$105,779

No intervenors presented evidence or opposed the Foothills (Yukon) application to include these construction expenditures in the rate bases of Foothills (Alta.), Foothills (South B.C.) and Foothills (Sask.).

The Touche Ross & Co. report to the Board on the expenditures for the Alaska Highway Gas Pipeline Project for the five month period ended 31 December 1980 indicated that the audit was not complete. The auditors will complete the audit work in respect of construction costs in Zones 7 and 8 in 1981 and report their findings to the Board.

Decision

In view of the above, the Board grants approval for the inclusion of the construction expenditures incurred during the period 1 August to 31 December 1980 of $105,779,000 in the provisional rate bases of the Foothills (Yukon) subsidiaries by zone as applied for, subject to the adjustments required by the remaining sections of this Chapter. When the results of the completed audit are on record, the Board will examine these expenditures in a future proceeding for final disposition regarding their inclusion in the respective rate bases.

5.3 AFUDC On Preliminary Expenditures

The audit report for the seven month period ended 31 July 1980 indicated that the sponsor companies calculated AFUDC on their preliminary expenditures initially at a rate equal to the sponsor companies' respective rates of return on rate base for 1979; however, the rate used was subsequently changed retroactive to 1 January 1980, to equal prime plus 5/8 per cent (the Foothills (Yukon) cost of debt). Under cross-examination, a witness for the Company stated that it was unlikely that the sponsor companies' cost of carrying the expenditures was totally debt-related. It was established that the actual draw-down of the bank loan by Foothills (Yukon) did not occur until the end of August 1980. In its filed evidence, Foothills (Yukon) also indicated that it did not use a combined debt/equity composite rate until March 1981, subsequent to the actual "roll down" of the sponsors' equity investment, (see Chapter 8). That is, prime plus 5/8 per cent was used by Foothills (Yukon) as the rate for AFUDC purposes for 1980 and the first two months of 1981, before there was an equity investment actually recorded on the books of the Foothills (Yukon) subsidiaries.

The Company did not present any convincing evidence to support the change in rate used by the sponsor companies from their rate of return on rate base to prime plus 5/8 per cent.

Of concern to the Board is the rate used by the sponsor companies to calculate AFUDC prior to the date of the "roll down" of the sponsors' expenditures into the rate base of the project

companies, effective 31 July 1980, and the rate applicable to the sponsors' investment thereafter.

Decision

With little evidence to support the altered method of calculation, the Board rules that for the period prior to 31 July 1980, AFUDC shall be allowed at the rate of return on rate base of the sponsor companies. For the period after 31 July 1980, any expenditures under the Agency Agreements, until they have been "rolled down", will be allowed an AFUDC rate equal to the sponsor companies' rate of return on rate base. For the same period, AFUDC will be calculated on expenditures incurred by Foothills (Yukon) and its subsidiaries, including costs which have been "rolled down", at the actual cost of debt of the Foothills subsidiary companies plus a return at the non-incentive rate on equity funds used. The non-incentive rate to be applied to equity funds used in construction in Zones 6, 7, 8 and 9 is 17.50 per cent as established in the Phase III Decision.

The Board will require the Company to recalculate the AFUDC provision in accordance with the above decision and file with the Board its working papers in support of the calculation, showing separately the adjustments resulting therefrom. The Board will also require that the appropriate revisions to the rate base data contained in Exhibit 6 under Tabs 7 through 9 be served on the Board and all interested parties.

5.4 Other Matters re: 1980

5.4.1 Agency Agreements

The Company indicated that the Agency Agreements between Foothills (Yukon) and its sponsors with respect to Phase 1, prebuild, terminated effective 31 July 1980. The Company also indicated that the transfer of the related expenditures up to that date (roll down) from sponsors to Foothills (Alta.), Foothills (Sask.) and Foothills (South B.C.) in exchange for shares was actually made 28 February 1981 following receipt of favourable tax rulings. Details of the roll down are included in Chapter 8 of these Reasons.

5.4.2 Tax Treatment of 1980 Preliminary Expenditures

In the Phase 1 and Phase 1V(b) Decisions, at pages 49 and 5-3 respectively, the Board ruled on the income tax aspects of the preliminary expenditures prior to 1980.

Decision

The Board finds that those previous rulings on the tax aspects of preliminary expenditures prior to 1980 should also pertain to the 1980 preliminary expenditures.

5.4.3 NPA and NEB Charges

Included in the preliminary and construction expenditures for 1980 are charges, pursuant to Section 29 of the Act, of $4,843,000 from the NPA and $252,000 from the NEB. These charges are subject to audit by the Auditor General of Canada.

Decision

Foothills (Yukon) is authorized to include the above amounts in its rate base and those of its subsidiaries. If the Auditor General's examination results in any changes to these sums, the Board will review the matter to decide the amounts for permanent inclusion in the rate bases.

5.4.4 Reduction of 1978 and Prior Years' Expenditures

In the Phase IV(b) Decision, the Board accepted a correction from Foothills (Yukon) to adjust the previously approved preliminary expenditures of $79,111,000 to $78,966,000, a reduction of $145,000. Subsequent to the closing of that phase of the proceeding, the Board received information from Foothills (Yukon) in a letter dated 7 May 1980 which, among other things, indicated that the previously approved expenditures should have been further reduced by $62,000 to $78,904,000.

Decision

The Board now varies the amount previously approved, in respect of the 1978 and prior year expenditures, for inclusion in rate base of Foothills (Yukon) by reducing the $78,966,000 to $78,904,000 to reflect the above reduction of $62,000.

6. NORTHERN ALBERTA BURST TEST FACILITIES (RAINBOW LAKE)

In its Phase IV(b) Decision the Board stated:

> "The Board is not satisfied with the evidence on these burst test facilities and grants provisional approval only. In the interim, the Company will retain the 1979 costs in the rate base of Foothills (Yukon) and the Board will expect the Company to provide further evidence on capital cost of the facilities, operating costs of the facilities, recovery of operating costs, and a justification of why the facility should be included in rate base as part of the pipeline rather than being classified under account 110, Other Plant, as defined in the NEB 'Gas Pipe Line Uniform Accounting Regulations'."

Foothills (Yukon) has complied with the Board's instructions above and, in this proceeding, presented evidence on the lack of future prospects for the commercial use of these facilities and on the inter-relationship between the requirements for these facilities for the prebuild and for the mainline phases of the pipeline. No intervenor presented evidence or opposed the Company's approach.

Decision

The Board confirms the approval given on a provisional basis in the Phase IV(b) Decision, but with the variation that Foothills (Yukon) may include an allocation of expenditures on the Northern Alberta Burst Facilities in the rate bases of the subsidiary companies in accordance with the decision on the Method of Allocation set out in Chapter 4. The Board considers that the physical control over the facilities rests with Foothills (Yukon) and accordingly expects Foothills (Yukon) to maintain memorandum records that will indicate the allocation to subsidiaries of the capital cost of the facilities and of adjustments resulting from any future additions or disposals of part of the facilities. The operating costs and cost of maintaining the facilities shall be accounted for by Foothills (Yukon).

7. APPROVAL FOR PROVISIONAL RATE BASE PURPOSES - ESTIMATES OF COSTS TO BE INCURRED IN 1981 TO COMPLETE CONSTRUCTION IN ZONES 7 AND 8

The NEB's Method for Regulating the Tolls and Tariffs of the Foothills (Yukon) Pipeline, pages 6 to 11 of Appendix C of the Phase I Decision provides:

> "8. If, at the time the pipeline is due to commence operations, all actual costs have not been determined, the Board will permit estimates to be used provided the Board has approved the estimates in advance."

At the Board's request, the Company prepared a "Forecast to Complete for 1981" for Zones 7 and 8.

During the hearing, the Company requested that, for the period 1 January 1981 to completion, it be permitted to include in rate base the actual costs as incurred rather than the forecast of expenditures by month as estimated.

Decision

The Board accepts as reasonable the Company's estimate of costs to complete, with the exception of the meter station at Kingsgate, comments on which follow. The Board approves these estimates, including AFUDC, for provisional rate base purposes for Zones 7 and 8 as follows:

Western Leg Forecast to Complete for 1981

($000)

Zone 7		$13,237
Zone 8	$22,091	
Less: Kingsgate Meter Station	4,112	17,979
		$31,216

Recognizing the reasonableness of the Company's request to include actual costs instead of monthly estimates, the Board will accept the inclusion in rate base of actual costs as incurred within the limits of the total estimate by Zone as approved herein.

The actual costs incurred in 1981 to complete construction in these zones will be examined by the Board in a future proceeding when the results of the audit thereof are on record. At that time the Board will review the actual costs incurred for permanent inclusion in rate base.

7.1 Kingsgate Meter Station

The Company included in its filing a request that $4,112,000 for the construction of the Kingsgate Meter Station be allowed for inclusion in the provisional rate base. During cross-examination, a witness for the Company stated that the existing ANG meter station could handle the initial volumes of gas to be moved on the prebuild facilities. Although the Company indicated that construction of its new meter station would commence in June 1981, it presented no convincing evidence that this meter station would in fact be built in 1981 or would go into operation at the time gas begins to flow. In addition, the cost of service under the Gas Transportation Agreement includes costs for the use of ANG's existing metering facilities at Kingsgate.

Decision

Accordingly, the Board does not approve the inclusion of this cost estimate into provisional rate base at this time. However, the Board would be prepared to review the costs for rate base purposes when the meter station is complete and ready for operation.

8. "ROLL DOWN" OF SPONSOR COMPANIES' PRELIMINARY EXPENDITURES

In the estimate of costs to be incurred after 1 January 1981 to complete construction of the prebuilt facilities in Zones 7 and 8, Foothills (Yukon) included the "roll down" of that portion of actual preliminary expenditures allocated to prebuild which was incurred by the sponsor companies prior to 1 August 1980 under their Agency Agreement with Foothills (Yukon). To the extent that the Agency Agreement has been amended, the Company filed a copy of that amendment during the hearing. However, in the Board's Phase IV(b) Decision, it was stated at page 5-3 that, when such an amendment of the Agency Agreement took place, the Company was required:

> "to specify and illustrate how the amounts approved to that date by the Board for inclusion in rate base of Foothills (Yukon) or its subsidiaries are to be transferred from sponsor, affiliates, or Foothills (Yukon) Agency Accounts to the plant account of Foothills (Yukon) and its subsidiaries."

Though the Company gave a brief explanation of this transfer, it did not supply the required illustration.

<u>Decision</u>

As these costs for 1980 have been approved in Chapter 5 of these Reasons, and approval for prior years was granted in the Phase IV(b) Decision, the Board approves these rolled down costs for inclusion in the provisional rate base for prebuilt facilities. Notwithstanding this decision, the amount of the transfer is subject to any necessary variation upon completion of the audit and adjustment for AFUDC as per Chapter 5, Sections 5.2 and 5.3 respectively of these reasons; the filing of the illustration of the transaction, including examples of all accounting entries used, is still required.

9. PROVISIONAL ONE-TIME ADJUSTMENT TO RATE BASE

The Company requested that the method for calculating the one-time adjustment under the IROR Scheme for Prebuilt Facilities in Zones 7 and 8 be changed to correspond with:

(a) a common equity component to be fully recovered by depreciation charges in equal monthly installments over the period from commencement of operation to 31 October 1987,

(b) a one-time adjustment to rate base for prebuilt facilities to be recovered as a component of cost of service by amortization over the same period of approximately six and a half years, and

(c) a recalculation of the one-time adjustment when the mainline is complete and the rate base for the prebuilt facilities is being revalued for mainline purposes.

On the above basis, the Company submitted an estimate of the one-time adjustment to rate base for the rate bases of Foothills (Alta.) - Zone 7 and Foothills (South B.C.) - Zone 8.

The Company conceded that its proposal would yield less revenue during the six and a half-year term than the previously-approved method of calculating the one-time adjustment based on a 25-year approach. However, the Company maintained that the six and a half-year method was consistent with the accelerated depreciation rate allowed for Prebuilt Facilities.

The Board notes that the Phase IV(a) Decision approved an accelerated depreciation rate for the Prebuilt Facilities in Zones 7 and 8 which was based on a 100 per cent write-off of the prebuild assets over the life of the firm export licences (to expire 31 October 1987) to ensure the financeability of the project. However, though the IROR Scheme was amended in Phase IV(a) to change the basis for performance measurement as explained in the Introduction and Background, no change was made in the method of calculating the one-time adjustment over a 25-year time frame.

Decision

On the basis of the evidence submitted in support of the Company's proposal to change the method of calculating the one-time adjustment, the Board is not convinced that the IROR procedures pertaining to the one-time adjustment should be altered.

The Board directs Foothills (Yukon) to calculate the one-time adjustment on the basis of the procedures established in Phase III and modified in Phase IV(b). The procedures will be the subject of a separate order of the Board.

The Board finds that costs related to the Kingsgate Meter Station, because of the decision in Section 7.1, should be excluded at this time from the calculation of the provisional one-time adjustment. A separate adjustment can be made based on the cost of the meter station when construction is completed.

The Board notes that the Gas Transportation Tariff - Phase I indicates that the one-time adjustment to rate base recorded in Account 179 will be depreciated at the same rate as the gas plant in service. The Board will require that the tariff be revised to reflect the fact that the one-time adjustment will be amortized at 4 per cent per year on a straight line basis.

PART IV

TARIFF AND COST OF SERVICE MATTERS

10. REVIEW OF GAS TRANSPORTATION AGREEMENT BETWEEN FOOTHILLS (SOUTH B.C.) AND ALBERTA NATURAL GAS COMPANY LTD

This agreement, which was reviewed and approved in the Phase II Decision, was set down for review during the current hearing in respect of any modifications that might be required arising from the 1980 ANG tariff hearing. The Board's Reasons for Decision for the ANG hearing were published in May 1980, subsequent to the close of the 1979-1980 tariff hearing.

The Company, in its prepared evidence in the current hearing, advised the Board that it had been informed by ANG that this agreement would not require modification as a result of the Board's ANG Decision of May 1980, and that no modification thereto had been requested by any other party.

Decision

The Board confirms the earlier approval of the Gas Transportation Agreement between Foothills (South B.C.) and ANG without further modification.

11. PROCEDURES RE OPERATING AND MAINTENANCE COSTS FOR THE FIRST YEAR OF OPERATION

The Board indicated in a letter to Foothills (Yukon) dated 4 February 1981, that it had considered various schemes for review of the operating and maintenance component of cost of service under the Foothills (Yukon) tariff during the first year of operation, and that it had not, at that time, found a scheme which would be more appropriate than the one envisioned for subsequent years. That is, as indicated in Phase I, the Board would require Foothills (Yukon) to defer the inclusion in the cost of service of actual operating and maintenance costs in excess of annual budgets previously approved by the Board, including carrying charges, pending the examination by the Board of such overruns.

In response to the Board's indicated willingness to consider alternative proposals on this subject during the public hearing, the Company requested automatic flow-through of such costs for all years, including the first year of operations.

Foothills (Yukon) did not provide extensive evidence in the hearing to support this request, which had not been previously considered in Phase I. The Company's main objection to the deferral requirement was that the associated time and cost required to get decisions from the Board would be out of proportion to the benefits to be gained.

Decision

The Board is not prepared to allow automatic flow-through of operating and maintenance costs, and finds that the scheme for controlling such costs during subsequent years is also appropriate for the first year of operation. Therefore, for the first year of operation, the Board will require Foothills (Yukon) to defer actual operating and maintenance costs in excess of budgets previously approved until the appropriate disposition thereof by the Board is determined. Procedures for approval of annual budgets and disposition of variances will be communicated to the Company in due course.

"5.72 Prior to each October 31 and April 30, Company shall estimate for each Zone and for each billing month during the six (6) month period commencing on the next following January 1 or July 1, respectively (a 'Billing Period') Company's Zone Cost of Service and Shipper's Zone Allocable Share.

Company shall use reasonable care in making such estimates, but shall have no liability for any inaccuracy therein. Shipper's Base Billing Amount for each billing month in a Billing Period shall be the sum of the products obtained by multiplying Shipper's Zone Allocable Share by the Zone Base Billing Amount for all Company Zones. The Zone Base Billing Amount shall be the sum of the Company's Zone Cost of Service for all billing months in the Billing Period, estimated pursuant to subsection 5.72 herein, divided by the number of months in that same Billing Period.

"5.73 If Shipper's share of Company's Cost of Service for any billing month shall be greater or less than Shipper's Base Billing amount for such billing month, an amount equal to the difference shall be Shipper's Deficiency or Overpayment, respectively, for such billing month."

Similar revisions were proposed for the Subsidiary Company Tariffs.

12.5 <u>"Deferred Depreciation Account" Changed to Read "Deferred Revenue Account" in Section 9.62 of Rate Schedule T-1 of Foothills (Yukon) Prebuild Tariff</u>

The change to "Deferred Revenue Account", as outlined by Foothills (Yukon), is in accordance with the requirements specified by the Board in page 2-7 of its Phase IV (b) Decision. Revised tariff pages incorporating the change were received from Foothills (Yukon) under cover of a letter dated 23 March 1981, and the filing was acknowledged by the Board in its reply dated 29 April 1981.

12.6 <u>Proposed Definition 1.7 Company's Cost of Service for Foothills (Yukon) Prebuild Tariff - General Terms and Conditions</u>

Foothills (Yukon) proposed adding the following definition:

"1.7 The term 'Company's Cost of Service' shall mean, relative to a billing month, the sum of the amounts determined as the Zone Cost of Service for each of Company's Zones."

This proposed definition is consistent with the tariff already filed by Foothills (Yukon).

12.7 Proposed Additions to, or Deletions from, Foothills (Yukon) and Subsidiary Companies' Tariffs of the Words "the", "a", and "such"

Minor amendments with regard to the addition or deletion of the words "the", "a" and "such" were proposed by Foothills (Yukon). The tariff pages and sections affected by these amendments were identified in Foothills (Yukon)'s written Direct Evidence, Exhibit 43, (J.H. Unryn, pages 20 and 21) as amended by transcript page 495.

Decision

With the exception of the proposed change to Section 8.7, Income Tax, in 12.1 above, the Board approves the foregoing changes as applied for.

Regarding the additions to General Terms and Conditions of the definitions proposed by Foothills (Yukon), the Company may wish to examine the numbering of these definitions as they would appear to duplicate the numbers of other definitions.

The Board notes that revised tariff pages regarding the change to "Deferred Revenue Account", (see section 12.5), have already been received by the Board. Foothills (Yukon) is required to file revised tariff pages incorporating the other amendments approved herewith prior to the commencement of service under this tariff. Foothills (Yukon) is also required to serve all such revised tariff pages, including those already received by the Board, on all interested parties.

13. REVIEW OF THE COST OF SERVICE TOLL FOR ZONES 7 AND 8 FOR 1981

The NEB's Method for Regulating the Tolls and Tariffs of the Foothills (Yukon) Pipeline was set out in the Phase I Decision Appendix C, pages 6 to 11. Under the section dealing with Cost of Service, paragraph 11 contains a listing of the costs that the Board is prepared to flow-through into the cost of service automatically, provided that either the principles or methods of computation have been previously approved, or that the costs are largely outside the control of the company. Included therein are the following:

i) operating and maintenance costs - up to the annual budget previously approved by the Board;

ii) return on rate base, being a combination of return on equity and actual interest expenses in conformity with the tariff;

iii) depreciation;

iv) income taxes on the basis approved by the Board; and

v) municipal or property taxes.

In response to the Board's request, Foothills (Yukon) filed an estimate of the total cost of service pertaining to prebuilt facilities in Zones 7 and 8, covering the period from the expected start-up date of 1 May 1981 to 31 December 1981. This information was required on a monthly basis by component as listed above.

13.1 Operating and Maintenance Budgets for 1981

The Company filed Operating and Maintenance Budgets for Zones 7 and 8 for 1981 totalling \$145,000 and \$562,600 respectively, covering an expected period of operation of eight months from 1 May 1981 to 31 December 1981.

In Zone 7, transportation service under the tariff is provided on the Foothills (Alta.) prebuilt facilities, which consist of three loops totalling 124 km paralleling the existing facilities of NOVA. NOVA, which is not regulated by the Board, has contracted directly with the shipper to provide transportation services between the Foothills (Alta.) loops in this zone. Under the Operating Agreement between Foothills (Alta.) and NOVA, the latter operates the prebuilt facilities for Foothills (Alta.). This Agreement and the

method of calculating charges thereunder were approved in Phase I of the tariff hearing. The Foothills (Yukon) tariff, Rate Schedule T-1, subsections 8.3 and 8.4(b), provides for allocation of the Company's Administration Charge equally between zones completed and commissioned for operations. The Operating and Maintenance Budget for Zone 7 is made up of charges arising from these two sources, NOVA and Foothills (Yukon).

In Zone 8, transportation service is provided on a combination of the Foothills (South B.C.) prebuilt facilities, being four loops totalling 89 km paralleling the existing facilities of ANG, and the facilities of ANG between the loops. The Foothills (South B.C.) Operating and Maintenance Budget for Zone 8, in addition to charges from ANG under an Operating Agreement between Foothills (South B.C.) and ANG and the Foothills (Yukon) Administration Charge, includes charges arising from the Gas Transportation Agreement between Foothills (South B.C.) and ANG for the use of ANG's facilities between the loops. This agreement has previously been referred to in Chapter 10. These agreements, including the method of calculating charges thereunder, were approved in the Phase II Decision, except that the method for allocation of costs from ANG to Foothills (South B.C.) under the Gas Transportation Agreement is subject to the approval of the Board in a forthcoming proceeding relating to ANG.

Should ANG's allocation methods be altered by the Board in the ANG proceeding, Foothills (South B.C.) is required to make any alterations necessary to conform with the revised ANG allocations method.

In reviewing the Operating and Maintenance Budgets, the Board noted that the components of the Administrative Charge from Foothills (Yukon), as is required under subsection 8.4(b), Rate Schedule T-1 of the tariff, had been allocated equally between Zones 7 and 8 except that Insurance costs were allocated on the basis of the estimated value of insurable items within each zone. This method seems reasonable to the Board.

Decision

The Board approves the eight-month Operating and Maintenance Budgets for Zones 7 and 8 as filed. Since the start-up did not take place on 1 May 1981, the Board directs that the budget for operating and maintenance costs for Zones 7 and 8 will be determined on the basis of one-eighth (1/8) of the filed budget allocations to such zones for each month that the prebuilt facilities are in operation during 1981.

13.2 Return on Rate Base and Capital Structure

The illustrative returns on rate base for Prebuilt Facilities Zones 7 and 8 which were included in the estimated 1981 cost of service were based on a 75:25 debt to equity ratio, a cost of debt of 18 per cent and a rate of return on equity of 17.9 per cent.

This rate of return on equity was used by the Company in anticipation that its performance of cost control under the IROR Scheme would entitle it to a one-time adjustment to rate base which would yield a return on equity under this scheme of 17.9 per cent. However, it was acknowledged that, in the event an estimate of the one-time adjustment under the IROR Scheme was approved for inclusion in rate base, the rate of return on equity should be 16 per cent as established in Phase III of the tariff hearing.

During cross-examination, the Company's witnesses testified that they expected the capital structure on completion of construction to be very close to the 75:25 debt to equity ratio which was regarded in the Phase III Decision as approximating an optimal capital structure for the Company.

Decision

Since an estimate of the one-time adjustment will be included as a component of rate base, as discussed in Chapter 9, the Board directs the Company to calculate the return on rate base by using the actual cost of debt as incurred and a return on equity, including the one-time adjustment, at a rate of 16 per cent, as established in Phase III of the tariff hearing.

The rate bases for Zone 7 and Zone 8, to which these rates will apply, are made up of allocations, as per Chapter 4, from the following components:

1. Preliminary Expenditures incurred in 1979, approved in Phase IV(b) of the tariff hearing;
2. Preliminary and Construction Expenditures incurred in 1980, as per Chapter 5 herein;
3. Northern Alberta Burst Test Facilities, as per Chapter 6;
4. Costs to be incurred in 1981, as per Chapter 7;
5. "Roll Down" of Sponsor Companies' Preliminary Expenditures, as per Chapter 8;
6. Provisional One-Time Adjustment to Rate Base, as per Chapter 9; and
7. A provision for working capital in accordance with the tariff.

13.3 Income Taxes

The Company requested that it be allowed to amend the Phase I Gas Transportation Tariff so that income taxes would be calculated on either a normalized or flow-through basis rather than the normalized basis as now authorized. The Company indicated the reason for this request was that under the Income Tax Act, pipelines are normally limited to claiming capital cost allowance (CCA) at a 6 per cent rate. Since the prebuild tariff allows depreciation at an accelerated rate (approx. 15 per cent per annum), income taxes payable will exceed the amounts collected when income taxes are calculated on a normalized basis. The Company had raised this issue with the Board in the Condition 12 hearing, held to establish the financeability of the project, at which time it was left unresolved.

The equity undertaking letters supplied by various sponsor companies were conditioned on the receipt of favourable rulings from the Department of National Revenue, Taxation. To date, there has been no such ruling and, therefore, the Company proposed the tariff amendments to ensure that tax collection under the tariff would be adequate to meet the tax liability of Foothills (Yukon) and its subsidiaries.

The Board acknowledges the validity of the Company's statement that the cash flow associated with the operation of the prebuilt facilities would be seriously diminished if, as a result of

the high depreciation and relatively lower CCA rates, income taxes payable to the federal government were in excess of income taxes collected under the Phase I Tariff.

Decision

While recognizing the need for the Company to be kept whole, the Board is not prepared at this time to alter the method of accounting for income taxes under the Prebuild Tariff pending the receipt by the Company of a ruling from the Department of National Revenue, Taxation. In any event, the Board does not consider that it has sufficient basis in the evidence before it to come to a decision on this request. In the absence of a favourable ruling within a reasonable time, the Board would be prepared to consider further representations from the Company.

13.4 Depreciation and Property Taxes

In the estimate of the cost of service as filed, the Company included a provision for depreciation in accordance with the rates for depreciation for prebuilt facilities in Zones 7 and 8 as approved in the Phase IV(a) Decision. These provisions for depreciation are subject to adjustment for any change in the total rate base arising from decisions indicated in the chapters listed above under 13.2.

Under the NEB's Method for Regulating the Tolls and Tariffs of the Foothills (Yukon) Pipeline, municipal or property taxes are, in the absence of unusual circumstances, allowed to flow through automatically into the cost of service.

Decision

No unusual circumstances having been identified, the Board finds the estimate of Property Taxes as filed for inclusion in the Estimate of Cost of Service to be reasonable. The Board accepts the provision for Depreciation as filed, subject to adjustments which may be required as noted above.

PART V
DISPOSITION

14. DISPOSITION

Throughout the preceding chapters, the Board has recorded a number of decisions. The foregoing, together with Order No. TG-2-81, which orders Foothills Pipe Lines (Yukon) Ltd. to file new tariffs and tolls conforming therewith and which is shown as Appendix I hereto, set forth our Decision in this matter.

R.F. Brooks
Presiding Member

J.B. Jenkins
Member

R.B. Horner
Member

Ottawa, Canada
August 1981.

NATIONAL ENERGY BOARD — CANADA — OFFICE NATIONAL DE L'ÉNERGIE

ORDER NO. TG-2-81

IN THE MATTER OF the National Energy Board Act and the Regulations made thereunder, and of the Northern Pipeline Act; and

IN THE MATTER OF the tariff and tolls to be charged by Foothills Pipe Lines (Yukon) Ltd. (hereinafter referred to as Foothills (Yukon)) in the operation of its prebuild facilities in Zones 7 and 8, and other related matters, File No. 1562-F6-2

B E F O R E the Board on Wednesday, the 12th day of August, 1981.

WHEREAS Foothills (Yukon) filed with the National Energy Board (hereinafter referred to as "the Board") an application dated the 6th day of October, 1980, for approval of the Final Design Cost Estimates for prebuild facilities in Zones 7 and 8 for purposes of determining the Incentive Rate of Return on equity invested in those facilities;

AND WHEREAS the Board issued Order No. RH-3-81, dated the 4th day of February 1981, setting the application down for a public hearing, together with various matters specified in that Order related to the tariffs and tolls to be charged by Foothills (Yukon) in respect of the transmission of natural gas through the prebuild facilities in Zones 7 and 8, including an estimate by Foothills (Yukon) of the cost of service toll to be charged in 1981;

AND WHEREAS Foothills (Yukon) raised certain additional matters for decision by the Board;

AND WHEREAS a public hearing was held in the City of Ottawa, in the Province of Ontario, commencing on the 31st day of March 1981, at which the Board heard evidence and submissions of Foothills (Yukon) and other interested parties;

AND WHEREAS the Board has, following a public hearing in four phases held pursuant to Order No. RH-2-79, dated the 12th day of April, 1979, at which all interested parties were heard, made certain determinations respecting the tariff and tolls to be charged by Foothills (Yukon) in the operation of the said facilities, including the approval of the Gas Transportation Tariff-Phase I, dated April

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1980, being the tariff applicable to the prebuild facilities, subject to certain amendments required by the Board, which amendments were filed for the approval of the Board in the hearing held pursuant to Order No. RH-3-81;

AND WHEREAS the Board, having considered the evidence and submissions, is satisfied that the tolls to be charged by Foothills (Yukon) in accordance with this Order are just and reasonable;

IT IS ORDERED THAT:

1. Foothills (Yukon) shall, effective on the day of commencement of operation of the prebuild facilities in Zones 7 and 8, charge in respect of natural gas transmitted by it through the said facilities in each month only those tolls for each such month as are determined in accordance with this Order and with:

   (a) Order No. TG-1-79, as amended by Order No. AO-1-TG-1-79, and Order No. TG-4-79;

   (b) The Board's Reasons for Decision dated August 1981, resulting from the hearing held under Order No. RH-3-81;

   (c) The Board's Reasons for Decision dated July, October, and November, 1979, and March, May, and June 1980, resulting from the public hearing held under Order No. RH-2-79.

2. In this Order:

   "Foothills (Alta.)" means Foothills Pipe Lines (Alta.) Ltd., a subsidiary of Foothills (Yukon), which will own, operate, and manage the prebuild facilities in the province of Alberta;

   "Foothills (South B.C.)" means Foothills Pipe Lines (South B.C.) Ltd., a subsidiary of Foothills (Yukon), which will own, operate, and manage the prebuild facilities in the province of British Columbia;

   "prebuild facilities" means the portion of the Foothills (Yukon) pipeline built to transmit for export natural gas of Canadian origin before the remainder of the pipeline is placed in service for the transmission of Alaskan gas;

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"Zone 6" to "Zone 9" mean the corresponding zones defined in Annex II to the Agreement Between Canada and the United States contained in Schedule I to the Northern Pipeline Act.

3. Foothills (Yukon) shall, prior to the commencement of operation of the prebuild facilities, recalculate, in accordance with this Order and the Reasons for Decision referred to in paragraph 1, and file for the approval of the Board:

(a) the Final Design Cost Estimates for prebuild facilities in Zones 7 and 8,

(b) the estimate of the one-time adjustment to the rate base of Foothills (Alta.) and to the rate base of Foothills (South B.C.) for prebuild facilities in Zones 7 and 8 respectively, following the procedures set out in Board Order No. TG-5-81, and incorporating the recalculated estimates described in subparagraph (a);

(c) the rate base of Foothills (Alta.) and the rate base of Foothills (South B.C.) for prebuild facilities in Zones 7 and 8 respectively, calculated as of the expected date of commencement of operation of the facilities in those Zones, and incorporating the recalculated adjustments described in subparagraph (b);

(d) the estimated total cost of service for 1981, calculated as of the expected date of commencement of operation of the facilities in each Zone, applicable to the transportation of natural gas in each of Zones 7 and 8, and incorporating a return on equity of 16 per cent and income taxes calculated on a normalized basis;

4. For the purpose of determining the tolls to be charged in respect of the transmission of natural gas through the prebuild facilities in each month, Foothills (Yukon) shall calculate its cost of service for each such month in accordance with the procedure set

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out in the Gas Transportation Tariff-Phase I, modified as necessary in accordance with this Order, and incorporating:

(a) a return on equity of 16 per cent,

(b) taxes calculated on a normalized basis, and

(c) where applicable, the recalculated amounts approved by the Board pursuant to paragraph 3.

5. In calculating the rate bases of Foothills (Alta.) and Foothills (South B.C.) for each month, Foothills (Yukon) shall include as additions to rate base actual expenditures in the year 1981 on construction of prebuild facilities up to the limits of $13,237,000 for Zone 7 and $17,979,000 for Zone 8, and shall not include any expenditures in excess of those limits until the Board otherwise directs.

6. The approved budgets for Operating and Maintenance Expense for Foothills (Alta.) and Foothills (South B.C.) in Zones 7 and 8, respectively, shall be one-eighth of $145,000 and $562,000, respectively, for each month or part thereof during which the pipeline is operated during 1981, except that the budget for Zone 8 shall be adjusted as necessary to conform with any alteration ordered by the Board in the method of allocating costs to Foothills (South B.C.) under the Gas Transportation Agreement with Alberta Natural Gas Company Ltd. for the transmission of natural gas through the facilities of the latter company.

7. Foothills (Yukon) shall not include in the tolls to be charged any amounts on account of Operating and Maintenance Expenses which are in excess of the budgets approved in paragraph 6, until the Board otherwise directs.

8. Notwithstanding the Gas Transportation Tariff - Phase I, where Foothills (Alta.) or Foothills (South B.C.) incur Operating and Maintenance Expenses in excess of the approved budgets, such excess expenses shall not be included in the respective rate bases, but

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shall be recorded in a subaccount of Account 179, Other Deferred Debits, established for the purpose, together with carrying charges calculated each month at the rate of one-twelfth of the sum of the current commercial bank prime rate plus one per cent on the average of the opening and closing balances for the month in the subaccount, until the disposition of any balance in such subaccount is determined by the Board.

9. Foothills (Yukon) shall, on or before a date to be established by the Board, file for the approval of the Board the Final Design Cost Estimates for prebuild facilities in Zones 6 and 9, recalculated in accordance with the Reasons for Decision dated August, 1981.

AND IT IS FURTHER ORDERED THAT:

10. Foothills (Yukon) shall, in addition to the recalculations for Zones 7 and 8 referred to in subparagraphs 3(a) and (b), file with the Board prior to the commencement of operation of the prebuild facilities, working papers satisfactory to the Board setting out the detailed calculation of the Provision for Funds Used During Construction incorporated in each recalculation.

11. Foothills (Yukon) shall, in addition to and at the time of filing the recalculations for Zones 6 and 9 referred to in paragraph 9, file with the Board working papers satisfactory to the Board setting out the detailed calculation of the Provision for Funds Used During Construction incorporated in the recalculations.

12.(1) Foothills (Yukon) shall, in addition to the recalculations referred to in subparagraph 3(c), file with the Board prior to the commencement of operation of the prebuild facilities, working papers setting out the detailed calculations of the Allowance for Funds Used During Construction for 1980 in respect of preliminary and construction expenditures incurred by Foothills (Yukon), its sponsors and subsidiaries.

(2) Foothills (Yukon) shall make all revisions necessitated by the decisions contained in the Reasons for Decision dated August, 1981, to the rate base and cost of service data shown under tabs 6, 7 and 9 of Exhibit 6 in the hearing held

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pursuant to Board Order No. RH-3-81, and shall, prior to the commencement of operation of the prebuild facilities, serve the revised data on the Board, on every known shipper of natural gas through the said facilities, and on each party to the said hearing.

13. Foothills (Yukon) shall maintain memorandum records showing the allocation to the rate bases of subsidiary companies in accordance with Chapter 6 of the Board's Reasons for Decision dated August 1981, of the capital cost of the Northern Alberta Burst Test Facility, and of adjustments to such capital cost resulting from all future additions to or disposals of assets forming part of the facility, and shall maintain in its own accounts the Operation and Maintenance costs of the facility.

14. Foothills (Yukon) shall, prior to the commencement of operation of the prebuild facilities, file with the Board a description of the manner in which preliminary and construction expenditures related to prebuild facilities, incurred by the companies sponsoring Foothills (Yukon) under their Agency Agreement with Foothills (Yukon) which terminated effective the 31st day of July, 1980, have been transferred to the rate bases of Foothills (Yukon) or its subsidiaries, which description shall include the actual accounting entries used to record the transfer.

15. Foothills (Yukon) shall revise its Gas Transportation Tariff - Phase I in accordance with the Reasons for Decision dated August, 1981, and wherever necessary to make the said tariff correspond to the calculations or methods of calculation referred to in paragraph 3 of this Order or in the Reasons for Decision referred to in paragraph 1 of this Order, and shall forthwith serve a copy of each page so revised on the Board, on every known shipper of natural gas through the prebuild facilities, and on each party to the public hearing held pursuant to Order No. RH-3-81.

16. Any provision of the Foothills (Yukon) tariff, tolls and rates, or any portion thereof, that is contrary to any order of the Board,

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or to any determination of the Board contained in any of the Reasons for Decision referred to in paragraph 1, is hereby disallowed effective on the date of this Order.

NATIONAL ENERGY BOARD

G. Yorke Slader
Secretary